The Builder.

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Kentish Brasses.

IN the work thus entitled* Mr. Belcher has aimed, we believe, at giving a complete illustration of the monumental brasses in Kent, a county so rich in this class of memorials. He has at all events produced a very large collection of the brasses of the county, illustrated in very good plates, all as far as possible dated, and all with scales appended—the latter a point not unfrequently forgotten; the brasses being in most cases photographed from full-sized rubbings, the necessity of a scale is not obtruded on the attention in the first instance, and is too often overlooked afterwards.

The only thing we should have desired differently arranged in the volume would have been that the examples should have been placed in at least a general chronological order, so as to bring before the reader at a glance the changes in style in regard to execution, costume, and character of the representation attempted, as time went on. We can see no reason why this should not have been done, as it is merely a question of the order of the plates, and it would certainly have been an improvement, and would have illustrated more directly, also, the author's own remarks, in the preface, as to the alteration in character in the later brasses. On this point, however, we cannot quite concur with all that is said. After mentioning the historic interest of brasses to the students of genealogy and heraldry and costume, also to the architect, "who will see in the beautiful canopies so often found the details and arrangements and characteristics of each successive style of his art" (the architect would hardly make a satisfactory study from the brasses, however, if he had not the buildings as well), Mr. Belcher observes:—"The artist has examples in the earliest of these engravings of the beauty and excellence of his work; and can trace, as they come nearer to our own time, their gradual deterioration; for so it is, that the earliest are the best, and the latest (for they come down to the seventeenth century) are the most tasteless and badly executed." In a general way, it is true that the earlier brasses are finer in style and more monumental in feeling; but it is hardly fair to trace the inferior dignity of the later ones entirely to the fault of the artist. The fact is that, as the brass always represented the costume of the day, the later artists in these engraved monuments fell upon times when dress was much less dignified and picturesque than in the earlier days, and also much more "fussy" in line and detail, and therefore much less suitable for production in a form of representation which must deal chiefly with outline. Ruffs and laced dresses are doubtless much less suitable for delineation in a severe monumental style than a suit of armour or a "cote-hardie." But that is not the fault of the brass engraver, who had to do his best with the costume set before him. And the remark that the brasses were "real, or, as in more modern days, fanciful representations of those commemorated," appears from the examples published in this very book to represent nearly the reverse of the fact. The inferior effect and less serious and monumental character of the later brasses is in great measure actually due to their more realistic treatment. In the earlier brasses the knight in armour is shown in a stiff, formal flat drawing—a kind of elevation drawing, so to speak—which is very severe in style and solemn in expression, but does not convey the idea of portraiture. In the modern examples there was obviously, from the more varied and individual character of the heads, a more decided attempt at portraiture, as well as an attempt to give a perspective representation of the figure instead of a flat diagram. It it very possible that the engravers of the earlier brasses would have done the same had they had the requisite skill in drawing. As a matter of fact, they had not, and their brasses are therefore less realistic than the later ones, but it is quite possible that they were as realistic as their artists knew how to make them. The inability to represent with more realism was perhaps an actual gain; it necessitated a severe style of execution in harmony with the architecture to which the brasses formed a kind of decorative adjunct, and which gives a pathos and solemnity to these more ancient figures beyond, we admit, what is found in the seventeenth century examples. But we are by no means sure that the difference arose from any deliberate feeling or intent on the part of the older engravers; it was a matter of "environment" as much as anything else.

Where the older brass engravers were really superior to the later ones was in the fact that, whether from instinct or deliberate choice, they confined their delineations to the expression of the outline and the main lines of armour or dress in a comparatively few carefully-designed lines, and with no attempt at shading or pictorial effect. It is the shading and hatching that spoils the effect of the later brasses so much. The process is emphatically one for outline drawing, for clean and precise lines, each of which has its meaning, and not for shading up; by the latter process the decorative appearance of the brass is only blurred, and the pictorial effect supposed to be aimed at is, after all, not achieved. Here the older men were really superior as artists to the later ones: they knew better where to stop, and what were the limits of expression of their process.

Among the examples given in this book (which contains no fewer than 109 plates of large octavo size), none are finer in an artistic sense, or more impressive in effect, than the armoured figures of dates 1395, 1405, 1407, shown in plates 96, 39, and 40. In plates 40 and 96 (from Cobham and Seal respectively), the armed figure is drawn in the simplest lines, yet with conscientious attention to the construction of the mail; the band of geometric decoration around the hips has the more effect by contrast with the plain surfaces of the rest of the body-armour; and the chain-mail for the neck, out of which the head rises, gives a kind of leonine breadth and grandeur to the figure which is very impressive. A great deal of this effect is a matter of costume, no doubt; it did not appeal to the contemporaries of the person commemorated as it appeals to us. From our modern point of view it seems a costume of such majesty and dignity as is never met with now, and the simple and severe form of engraving in which it is shown seems equally in keeping. No. 40 the author calls "the finest military brass of the period." There is an inscription round and an elaborate architectural canopy over. No. 96 has also a decorative inscription border, with the emblems of the Evangelists in small panels at the angles. A characteristic contrast to these two is the brass of Thomas Nevynson (Plate 51), from Eastry, in a kind of "elegant" attitude, drawn in perspective, with a meek, slightly-stooping attitude; this is the best of several of somewhat similar stamp

* Kentish Brasses. Collected by W. D. Belcher, Member of the Kent Archæological and Harleian Societies. London: Sprague & Co. 1888.

dating from the latter part of the sixteenth or the early part of the seventeenth centuries. In regard to grandeur of style and character these are, no doubt a great descent from the early fifteenth-century examples, and the change is not less marked in the female figures, from the grandly-flowing robes of the earlier figures to the thick-waisted, wide-skirted, and often hatted women of the sixteenth and seventeenth century brasses, with their skirts in some cases resembling a large butt or barrel out of which the head and shoulders seem to rise. This, again, is more a matter of costume than anything else; but it is sufficient to make all the difference between the heroic appearance of the more ancient figures, which are emphatically those of knights and ladies, to the comparatively bourgeois style of the figures of the later time, the women especially, whose brass effigies seem those of pious house-wives rather than of high-born ladies. It is noticeable that the earlier brasses seem to exaggerate very much the thin proportions of the waist in the female figures,—apparently, then, as among many unwise persons now, considered a mark of feminine superiority of style and breeding; but the effect is less ugly in the flowing robe of the older period than in the later or the modern dress, where the pinching in of the waist is deliberately marked and emphasised.

Architectural canopies are numerous in the brasses illustrated in this book, mostly of much the same date, about the early part of the fifteenth century; and even when there is a difference of half a century between them, from *circa* 1350 to *circa* 1400, there is little distinction in feeling or character of detail. They generally consist of a framework formed by a very thin buttress seen in front elevation, with its base mould and an open stage with a crocketted pinnacle over at the top, and a profile indication of a shaft and capital on the inner sides of the buttresses, from which spring a foliated arch with an ogee crocketted and finialed gablet; in fact, they are like the detail of a bit of rood screen architecture of the period represented *en silhouette*. An example from Cobham dated 1298 shows a shaft only, without the buttress form, supporting pinnacles with a trefoil arch and a straight-lined crocketted gablet between. In one case, dated 1450 (plate 100, from St. Clement's, Sandwich), occurs the geometrical delineation of a groining under the canopy, indicated in single lines, giving the projected curves of the ribs; this is unusual, and hardly in place in a representation on the flat, as a brass must necessarily be.

A figure of the rector, Peter de Lacy, from Northfleet Church, date 1375 (plate 88), is remarkable as a fine example of the decorative treatment of the sacerdotal robes in a manner quite accordant with the severe lines proper to a brass. There are several things in the book which are among the curiosities of brasses. A very odious one is the representation, from Margate, of the figure of the deceased as a skeleton, a piece of sensation unusual for the period to which it belongs (1446), but which may be paired off, as a piece of bad taste, with the skeleton tomb at Tewkesbury. The mural brass from Maidstone (plate 76) is a curious example of a kind of bad quasi-Classic architectural framework to the series of figures. Perhaps the very oddest thing is the brass of Mistress Silvester Lambarde, from Halling (plate 69), representing the deceased in a four-post bed, in a room defined by lines drawn to a vanishing point for the flooring, and a representation of a wall with masonry joints behind, her four older children standing about the floor, and the twins in a cradle by the bedside. The date is 1587. There is a kind of semi-humorous pathos in this; but it is needless to say that it is quite out of keeping with the artistic conditions of brass engraving, as well as with monumental character in the higher sense.

The brasses are shown in the usual way produced by rubbing: white lines on a black ground. Processes have been suggested lately for obtaining rubbings, or transfers, of them with dark lines on light ground, so as to give the real effect of the brasses, or something more like it. In regard to truth of effect this is desirable; but as far as brilliancy and attractiveness in the illustrations are concerned, we imagine nine people out of ten prefer the white on black as ordinarily shown, in which medium, to say truth, the decorative effect obtained often surpasses that of the originals; and considering that the facts of the design are conveyed with equal accuracy by either system, we do not know that there is really any necessity to change from a system of reproduction which is very simple and direct, and has the additional merit of making a very picturesque and effective plate. Still, it is as well to remind brass-rubbers and brass illustrators that the positive, instead of the negative, effect can be obtained, and that some readers and students may prefer it.

COLFE GRAMMAR SCHOOL COMPETITION.

THE designs by the five architects who were selected, after the first sketch-competition, to compete in the second competition for the proposed new Grammar School, have been exhibited this week in the Hall of the Leather-sellers' Company.

The stipulated limit of expenditure, 4,500*l.*, appears too small for the carrying out the scheme in a proper manner, as it is to include not only the building, containing a hall or large room, five class-rooms, rooms for masters, dwelling-rooms for porter and family, and lavatories and urinals for 200 boys, in a separate building apart from the school; but the same sum is also to include the entire completion of the playgrounds and of an ornamental fence on a dwarf wall with stone coping on the Lewisham Hill frontage. In the second notice to competitors a laboratory was also added to the requirements, but nothing seems to have been added to the original stipulated cost in consequence of this addition to the building. Each of the five selected competitors is to receive 25*l.* for his work. The Governors intend to employ as architect the author of one of the selected designs, but do not bind themselves to do so or to carry into execution any design selected. The plans are to show provision for future extension. The sum named does not include school fittings.

Taking the designs in the order of hanging, the first is that by Mr. E. Lyne Parsons. He, with one or two other competitors, adopts the plan of making the large hall the approach to most of the class-rooms, avoiding corridors to a great extent. The hall lies, roughly speaking, north and south, or parallel to the roadway of Lewisham Hill, and the class-rooms are mostly east and south of the hall. This condemns some of the class-rooms to a south light, which is not desirable in summer, as it means either working under a hot sun or with blinds down, either condition being very annoying to the workers, and much better avoided. The masters' rooms are on either side of the entrance. Some of the hat-and-coat rooms are practically lobbies of communication, which is not a very convenient or suitable arrangement. The design is a good and effective one, in the prevalent style of the day, with pilasters and window-heads apparently to be executed in brick, and shown in a good pen perspective. There is a clock-tower over the entrance. The whole seems far too ambitious, however, for the stipulated cost.

Messrs. Clark & Moscrop's design, which hangs the next, is a studiously plain and unambitious school-house, Elizabethan in character as far as architectural character is given to it. The drawings are not attractive, but the authors have shown good sense in studying economy under the circumstances, and there is nothing untasteful or unsuitable in the design. The hall is here also placed with its length north and south, but the five class-rooms are placed to east and north of it,—a much better arrangement in regard to light than in the last-named set. A corridor is carried round three sides of the hall; on the east side the three class-rooms are separated from it by movable partitions. The hall is lighted, besides an end window, by a range of small clearstory windows high up in the open timber roof, making an agreeable feature externally, but there may be a question whether it would be quite adequately lighted. Generally speaking, this seems a design suitable and well-planned, and has evidently been devised with the desire to get it, if possible, within the stipulated cost.

The design of Mr. H. T. Bonner shows some originality of treatment in the planning. The hall runs north and south, but at the east or further side of the building; three class-rooms are placed westward of it partitioned off and lighted towards Lewisham Hill; in front of these runs a corridor on a lower level communicating with entrances at each end, and in front of this are three hat and cloak-rooms in apsidal form opening out of the side of the corridor. The class-rooms are lighted above the level of this portion. These class-rooms with the little apses below them and the hall rising behind make a picturesque bit of architectural grouping, shown in a good water-colour perspective; but the arrangement of a stair from the corridor cut out of the floor space of each class-room is not a convenient or sightly one, and there is some oversight as to the levels, for we observe there are ten steps from the corridor level to the class-rooms, but only five from the same level to that of the end corridor leading to the hall, though on the section the hall and class-rooms are shown as on a level floor throughout. Of the other two class-rooms, the Head-Master's has a south light, the remaining one an east light. The design is obviously beyond the limit of cost.

The design by Messrs. Giles, Gough, & Trollope is the only one in which the principal entrance is not from Lewisham Hill but from the north end of the building, with a vestibule opening into the end of the hall, which is placed north and south, with three class-rooms on the west side partitioned off so as to combine with the hall, and two on the east side separate, between which is the exit to the playground and to the covered way to the latrines. The authors have placed the laboratory out in the playground, reached by the covered way, and forming part of the latrine block. This has its advantages in the way of position, for keeping smells of chemical work away from the main building, but it must add to the cost. There are no corridors except the short entrance one, the hall being the centre of traffic. The design is of a very plain character, with square mullioned windows; economy having been studiously considered as far as architectural treatment is concerned.

The design by Messrs. Weatherley & Jones is, in point of architectural treatment, the most picturesque and characteristic of the set, and the least costly among the three which aim at architectural effect; it is shown in a well-executed pen perspective. There is a central feature with two tiers of dwarf pilasters, with a gablet over, which marks the entrance, and a gable at each end of the front. A small clock-turret forms a central feature on the ridge of the roof. The plan is simply a collection of rooms ranged about and opening chiefly from the hall, which runs east and west, or at right angles to the direction taken in all the other plans. Four class-rooms open, two out of each side of it, two of which therefore have south light; the fifth class-room is at the north-west angle of the building, balanced by the laboratory at the south-west angle; the entrance between them. The four class-rooms can all be thrown into the hall at pleasure. The plan is a cleverly-contrived one, and the whole scheme combines picturesque effect with practical considerations of concentration and economy of space and construction.

The problem of economy with convenient arrangement under the conditions imposed appears, however, to be best solved in Messrs. Clark & Moscrop's design, as far as we can judge from a comparison of the drawings apart from the architects' descriptions, which were not appended to them. In fairness to the architects, this ought always to be done when public comment on designs is invited.

NOTES.

THE case of "Claxton *v.* Mowlem & Co.," which was heard before the Court of Appeal this week, is an illustration of the working of the Employers' Liability Act. The plaintiff was in the employ of the defendants, unloading ballast from a barge, a full bucket being sent up and an empty one down simultaneously. By carelessness in lowering, apparently, the buckets struck each other in passing, and the bucket going down was knocked off its hook and fell on the plaintiff. The latter claimed that the contractors' plant was defective, as the hooks should not have been open ones, and he made out that the banksman's order, "lower away," meant "lower away quickly," and was an incitement to undue hurry. This latter argument, which does not seem to have been specially commented on by the Judges, appears to us utterly absurd. The Court of Appeal, however, non-suited the plaintiff (who had previously been non-suited in the Divisional Court, after being awarded damages in the County Court), on the ground that the use of the open hook, which was proved to have been always used by contractors in work of this kind, did not amount to a defect under the Act, and that the banksman was not "delegated with the authority of the employer." We are sorry for the plaintiff, but we quite concur in the verdict on the evidence given. The case was one of those far too common ones of working men injuring each other by want of proper care and precaution in what they are about; and the moral is that they should learn to be more careful.

SIR ROBERT RAWLINSON, in his letter in Wednesday's *Times*, makes another vigorous attack upon the policy of the Metropolitan Board of Works in regard to the London sewage problem. He fully emphasises the doubts which have been frequently expressed in these columns, and by many engineers, as to the permanent utility or efficacy of the costly precipitation works now nearing completion at Barking,—which were fully described in our columns a fortnight ago. Indeed, Sir Robert goes so far as to say that these works, instead of tending to the "purification" of the Thames, as was gratuitously assumed by a *Times* reporter, will ensure "the continued pollution" of the river. Sir Robert says that on this question of sewage purification the Board "have gone mad from the beginning, the works they are now prosecuting being the ultimate passion of madness." He charges the Board with having entered upon the enormous works now in hand at Barking and Crossness without informing themselves of the present position of the sewage question. He says that they evidently do not know "what good progress has been made in the use of sewage when applied to land in broad irrigation in England and on the Continent, where the entire sewage of the town is disposed of year by year and all the year round, so as not to be a nuisance. There are sewage farms in England sufficient to convince any open-minded persons that where land can be acquired for broad irrigation the problem of what to do with sewage is solved. But on a very large scale, out of England, there is Berlin, where, by pumping, sewage is distributed all the year round over some thousands of acres of land with perfect success, and that which is done for Berlin may be done for London." Sir Robert denies that the Board are carrying out the recommendations of Lord Bramwell's Commission, as they profess to be doing. As Berlin has been mentioned by Sir Robert, we take the opportunity of saying that Mr. Charles Hancock, F.S.S., who has recently called attention to the subject in our columns, has lately received a letter from Herr Stadtrath Marggraff, the Chairman of the Sewerage and Sewage-Disposal Committee of the Berlin Municipality. Herr Marggraff writes:—

"We and the inhabitants of Berlin, as well as of the district around, are fully satisfied with the sewering of the town and with our irrigation system. Before beginning our works we have, for about ten years, made experiments, which are well described in the work, 'Cleansing and Drainage of Berlin' (Reinigung und Entwässerung Berlin), in about fourteen vols., with maps; and now that these works have been in operation for about fifteen years we are more and more satisfied every year. At the same time, the Berlin Sewage Farms (as you will gather from the annual report I send herewith) are beginning to yield a better revenue—even to the extent of giving a profit of two per cent. on the outlay—which I hold to be a very favourable result, considering the very extensive costs we have been put to in the preparation of the land, its levelling, draining, &c. We hope in the future for further favourable and even better successes, and we do not by any means think of giving up our system or adopting any other. I maintain that our method is the best—nay, for a large town, the only possible one. Deodorisation, chemical processes, precipitation schemes, are one and all—when tried on a large scale—hardly capable of being carried out with effect, and are very expensive too; while as to the resultant sludge, not only is it impossible to make advantageous use of the same, but the mere getting rid of it is a most difficult matter."

ON Monday the question was asked in Parliament as to the procedure in regard to notices to acquire property for street improvements in London during the next session of Parliament, in view of the fact that, while the London "County Council" will not be constituted in time to give the necessary notices, the Metropolitan Board of Works would have no power to carry out any improvements of which it might give notice. Mr. Ritchie was of opinion that there was nothing to hinder the Board of Works entering into schemes for street improvements and giving the notices, leaving it to the County Council, as the successors of the Board of Works, to determine whether they would proceed with any measure which the Board of Works might have introduced.

THE melancholy railway accident at Hampton Wick seems to have been one of the class of entirely inexcusable railway accidents—not the result of unexpected failure of any portion of the mechanism of the rolling-stock, or of the construction of the road or of signals, but simply and purely the case of an engine being where it had no right to be. Who is the person precisely to blame, and what, if any, degree of moral culpability attached to him, it would not, of course, be right or seasonable to suggest until we have the evidence on the inquest. We may observe, as to the surprise we have seen expressed that the driver and stoker of the light engine should not have observed that they were crossing the bridge on the wrong side, that this is not so extraordinary as may at first sight appear, when it is remembered that a driver is mainly concerned in looking out a-head for signals, not in looking on either side of him; and at night, of course, this is more especially the case; he looks for signal-lights alone, and in a dark night would hardly see anything else. People who have not been on the footplate of an engine do not realise how much the attention is concentrated on the engine itself and the signals in front. There is a well-known case of a driver on the Midland railway who, having pulled up on a very dark night to examine his engine on account of something sounding wrong, pulled over the reversing lever in the course of his examination, forgot that he had done so, and travelled some distance back in the dark before he discovered that he was going backwards. The forgetfulness about the reversing gear was very careless, but the incident shows that a driver may at night know very little where his engine is going.

THE Dean of Peterborough, in a letter to the *Times* of Wednesday, gives an account of a very interesting discovery of a richly-ornamented Saxon tombstone in the course of the excavation for underpinning the interior of the north transept wall of the cathedral. We extract a portion of the letter:—

"The surface of the slab is about 1 ft. 6 in. below the level of the late floor, which, in its turn, was about 5 in. above the Norman floor. The length of the slab remaining is about 5 ft. 3 in., with a top width of 1 ft. 10½ in., and a bottom of 1 ft. 6 in. The surface is completely covered with the richest Saxon interlacing ornament, forming a design of a central band of ornament about 5 in. wide, crossed at right-angles by rather wider strips of ornament. Three of these are uninjured; the fourth, at the top, was almost entirely destroyed, as I have already said, when the present transept was built by William de Waterville. The design was originally, therefore, a fourfold cross. Each of these crosses is outlined with a double-roll border, the inner one being twisted work. There is thus left between the borders of the cross arms three oblong spaces on each side between the broad central strip and the outer edge of the slab. Three of these are filled in with finer interlacing work, two with star crosses, and one is plain, having been left unfinished."

It has been decided to raise the slab perpendicularly to a position above the level of the new floor, so that it will be visible, but will still mark the position of the old grave which it formerly covered.

SOME conversation took place in the House of Commons on Monday evening in regard to monuments in Westminster Abbey, arising out of the fact that the erection of the monument to Lord Shaftesbury had been delayed owing to the committee not having been prepared with the funds to pay the fee of 400*l.* due to the Dean and Chapter of Westminster before the monument could be erected. The fee has been reduced to £250 in consideration of the fact that the erection of the monument is a matter of national interest; as the fees go to the conservation of the fabric, they also are paid in the national interest. From some correspondence which had previously appeared in the newspapers, it would appear that the Committee and secretary for the erection of the monument regarded themselves as rather ill-used persons in having this fee suddenly sprung on them, for which they were not prepared. But why did they not ascertain in the first instance the conditions of erecting a monument in Westminster Abbey? They could not suppose that any one was at liberty to bring a monument and put it up there as he pleased. Mr. Cavendish-Bentinck, in accordance with his usual policy in regard to art of trying to prevent anybody from doing anything, inquired whether the Government would consider the amendment of the Westminster Abbey Act with a view to prohibit the erection of any more monuments, but got no consolation from the leader of the House. Mr. T. P. O'Connor's cynical suggestion, that it might be well to wait till some years after a man's death before deciding that his fame justified a monument in the Abbey, is not without its point. We could name one bust of late years which would not have found entrance into the Abbey if that course had been adopted. But the deferring of the erection till several years after the death of the subject of the monument would take away a great deal of the interest of its inauguration; and the question as to whether the deceased filled a position in the front ranks of the men of his time is not really a difficult one to decide, if it is put to general public testimony and not to the voices of friends and partisans.

WRITING to the *Times* Lord Meath urges that, upon the approaching demolition, and sale of the site, of Millbank Prison, "a small part of the site should be made into a public playground, and another into a garden"—say, five out of the total 23 acres. This prison, one of the largest, and certainly the most costly of its kind, was begun in 1812, upon a plot of 16 acres, which had been bought some thirteen years before of Lord Salisbury for 12,000*l.* The plan was adapted from Jeremy Bentham's idea for a Panopticon or Inspection House. The six pentagonal buildings served for a while as a Penitentiary for London and Middlesex. In 1843 that style was changed to Millbank Prison. Various faults of construction,—as, for instance, narrow passages and basement and stone-paved cells,—combined with the natural unhealthiness of the situation, have contributed to throw this establishment far behind our modern conceptions of disciplinary or punitive

incarceration. Of late years, certain sanitary improvements having been effected, convicts condemned to penal servitude were conveyed hither to undergo the first period of sentence. Since the destruction in 1884 of the Tothill Fields Prison,*—successor to the old Bridewell, whose gateway has been set up against the Sessions House wall,—female prisoners have been sent to Millbank.

AUGUSTUS, sixth and late Earl of Buckinghamshire, in holy orders, died on October 29, 1885, leaving extensive estates in Ireland and in Buckinghamshire, the latter including the historic Hampden House. The property is heavily encumbered, and several annuities are set up by his lordship's will. An action for administration of the estate has, on two or three occasions during the past nine months, been before the Chancery Division. On December 20th Mr. Justice Kay made an order for the sale or mortgage of the properties in England and Ireland, in so far as is necessary to complete administration of the testator's estate. On April 13th an order was made for the sale of the Irish estates; but the tenants—who, it seems, are, as affairs now stand there, the only likely purchasers—cannot be induced to buy land which, as in this case, happens to be vested in co-owners. The matter having been again argued before Mr. Justice Kay on July 31st last, the Court directed that an action should be brought in Ireland for the partition of the estates in that country—those estates to be chargeable with the costs for the same. It was further decided that the order for sale of the English estates shall continue in force, all fair opportunity being first given for the sale in Ireland.

THE manor of Great Hampden is reputed to have been granted by Edward the Confessor to the ancestors of a family in whose possession it remained, by direct inheritance, until 1754. In the parish church of St. Mary Magdalen are numerous memorials of their house. The most ancient are the brasses to John Hampden (1496) and his wife, Elizabeth, and their ten children. Others commemorate Sir John Hampden, Knight (1553), and his two wives; Griffith (1591) and William (1597) Hampden, father and son. And here is the monument that was erected over the patriot John Hampden's grave by the Hon. Robert Trevor, who had succeeded to the property on the death of a John Hampden, last inheritor. Sir John Hobart, of Blickling House, Norfolk, married, *circa* 1655, for his first wife, Mary, widow of Colonel Hammond, and sixth daughter of John Hampden. His grandson, John, was elevated Baron Hobart, of Blickling, in 1728, and advanced Earl of Buckinghamshire on September 5, 1746. The main front of Hampden House, in the Classic style, was built by the above-named Robert, fourth Lord Trevor, who had assumed the surname and arms of that house, and on June 14, 1776, was advanced Viscount Hampden. The recent sale† of John Hampden's rapier—the blade 38 in. in length, inscribed "Wilhelm Wirsbergh, me fecit Solingen,"—occasioned some fine talk about its being the identical weapon which had been waved against Rupert's dragoons on Chalgrove Field. But there is extant a MS. cited in Gibbs's "Worthies of Bucks," and written by Lord Oxford upon the authority of Sir Robert Pye, of Farindon House, Berkshire, a son-in-law of Hampden. Pye's story, delivered to Colonel Sir Edward, father to Robert, Harley, is to the effect that Hampden himself, just before his death, said to Pye that one of his overcharged pistols had burst, shattering his arm, in a skirmish with the Royalists between Chalgrove and Thame. Beset by Rupert's men, and failing to reach Pyrton, he turned his horse northwards, and managed to ride round to Thame, where, at the then Greyhound Inn, now a shop in the High-street, he expired on Saturday, June 24, 1643. On the next day his remains were laid in the church we speak of. In 1863 a plain stone monument was erected near to Honour End Farm, in the parish of Prestwood, co. Bucks, with the inscription, "For these lands in Stoke Mandeville John Hampden was assessed 20 shillings ship money, levied by command of the King without authority of the law, 4th August, 1635," &c., &c.

ON Thursday, the 2nd instant, were sold at Phillips's Auction Rooms, in New Bond-street, the carved oak panelling and fittings from the old Chancery Courts, Lincoln's Inn. The two Courts that stood within Old-square were pulled down at the close of 1883. They were erected after the passing of an Act in 1841 for the appointment of two additional Vice-Chancellors, and formed the scene of many a suit similar to that of "Jarndyce and Jarndyce," which Dickens describes as being heard by the Lord Chancellor in the adjacent (old) Hall. In March, 1884, was demolished the Court which was built in 1819 at the north-western return of the then lengthened Hall, and wherein Sir Lancelot Shadwell, last titular Vice-Chancellor of England, used to sit. This was latterly the Court of Sir Richard Malins, with whom, in January, 1882, died also many of the more archaic traditions of the former Court of Chancery. As touching Old-square, we announced some twenty months ago that, by leave of the Benchers, the Society of Arts had undertaken to affix a memorial tablet against the chambers, at No. 24, which Mr. Secretary Thurloe occupied during the interval from November, 1646, to November, 1659. Old-square,—its staircases yet unnumbered,—was then known as Gatehouse-court. The duration of Thurloe's tenancy is clearly fixed by entries in the "Red Books" of the Inn. Dismissed from office, Thurloe disposed of his life interest here, and bought a similar term of some rooms on the upper two floors of a staircase in Dial-court, that was subsequently numbered as 13. In such a matter of general interest it were not impertinent to wish that the Society of Arts will delay no longer to fulfil their intention.

A CORRESPONDENT who is well acquainted with the lock trade writes:—"Architects and builders would do well to be upon their guard against certain recent developments in the manufacture of locks and keys which are no doubt the results of competition. First of all, let us take what are known as 'levered' locks. The only security of 'levered' locks consists in an arrangement by which the key on being turned catches up the levers each at a different level, to fit in with the notches of the key, until a certain point, at which every lever becomes parallel. This arrangement involves great care, and calls into requisition mechanical skill of a high order, and, in former years, the advantages in the way of real security thus provided were cheerfully paid for. America first set the fashion of making locks having levers all moving at one level with the key, so that, whether one or ten levers were inserted, it made not the slightest difference to the 'security' afforded, while, as a matter of fact, the so-called 'security' was not equal to the common 'warded' lock. Shams in 'wards' are as common as shams in 'levers.' Take, for instance, a 'solid ward.' This is supposed to be a ward cut or turned out of solid brass, having a series of semi-circular steps exactly fitting in to the corresponding wards in the key. The lately-developed 'sham' in 'solid wards' is that the wards are not solid, but hollowed underneath until they present a flimsy substance, and the wards of the key are so coarsely cut that they will 'fit anything.' The wholesale use of cast-iron keys is another serious question for the architect and builder. Keys hand-cut, or even machine-cut, afford a certain degree of variety in the wards which guarantee some sort of wholesale variation; but keys cast with the wards in, and produced by the million, with perhaps a dozen various wards in each thousand of keys, suggest at once to the burglar a prospect of easy business in the days to come."

"BLÄTTER für Architektur und Kunsthandwerk" is the title of a new architectural and art magazine, issued by Messrs. Braun & Co., of Berlin. It gives plates of new buildings, executed by the "Lichtdruck" process, which is analogous to what is known in England as "Phototype." These include a rather remarkable view of the tower of the Catholic Hof-Kirche, in Dresden, taken from the roof of one of the aisles. In the illustrations of modern work the architectural interest is hardly on a par with the execution of the plates.

WE have received a copy of the *Revue Universelle Illustrée*, possibly a hint taken from Mr. Harry Quilter's *Universal Review*, and apparently about on the same intellectual level. It contains political, literary, and artistic articles, musical compositions, a *feuilleton*, a pretty little sonnet by Pierre Gauthiez, and various illustrations, not of a high order of execution. An article on the "Ancienne Manufacture de Sèvres et ses Priviléges," the illustrations to which are the best in the number, may interest our readers. Our general impression, however, is that in these *omnium gatherum* magazines, where every kind of thing is offered at once, the usual result is that none of it is much worth having, except for very idle and superficial reading.

THE *Scottish Art Review*, which now appears as an illustrated monthly, keeps up its character as to literary matter, and gives its readers two charming reproductions from Corot and another from one of Romney's portraits; other articles are illustrated by well-executed marginal sketches. There is a little too much of what may be called the cant of æstheticism in some of the articles, but there is a good deal of thoughtful and suggestive writing.

THE June number of *Artistic Japan* has at last appeared—considerably out of date, it must be confessed. The illustrations, very well executed, include some charming bits of floral decoration, a ridiculous figure, and the ghost of a landscape.

THE LEAMINGTON MEETING OF THE ROYAL ARCHÆOLOGICAL INSTITUTE.

MANY years have passed since the members of the Royal Archæological Institute held a Congress-meeting in or near Warwickshire, and therefore the members in general were pleased to find that so new and so central a place as Leamington, and one whose neighbourhood contained so many scenes of interest, had been chosen by the Council as the head-quarters of this year's meeting. The Mayor and Corporation of the town, who invited them, have done their best to make the meeting a success; and, if the weather continues to improve a little, there can be no doubt that their object will have been attained. And the programme issued is certainly an inviting one; for it is not every neighbourhood in England that can show rival attractions to Stratford-on-Avon, Kenilworth, Warwick Castle, Stoneleigh Abbey, Coventry, and Baddesley Clinton; nor would it be easy to find a more kindly and genial President than Lord Leigh, the popular Lord Lieutenant of Warwickshire. Nearly all the magnates of the county give their names as patrons or vice-presidents, including the High Sheriff, Lords Northampton, Aylesford, Warwick, Clarendon, Denbigh, Jersey, Dormer, Compton, &c., Archdeacon Holbeche, Mr. H. S. Lucy, and Mr. J. Halliwell-Phillips. The local and general committee also was exceptionally strong,—nearly eighty in all, including most of the Midland antiquaries and the mayors of Leamington, Birmingham, Coventry, and Stratford-on-Avon. There are good names also among the presidents and vice-presidents of the three sections,—Antiquarian, Historical, and Architectural,—namely, the Revs. J. Hirst and W. Hunt, and Chancellor Ferguson, Dr. Cox, Professors Clark and Browne, the Rev. C. R. Manning, Mr. C. A. Buckler, and Mr. J. T. Micklethwaite.

The proceedings of the meeting were commenced on Tuesday by a gathering in the large room of the new Town Hall, which has been

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* See the *Builder*, March 8 and 15, 1884.

† At Messrs. Sotheby, Wilkinson, & Hodge's, on Tuesday, March 20, 1883. From the collection of the late Mr. J. Hain Friswell: purchased for fifty-eight guineas, for Mr. T. Bryant, of Surbiton.

placed at the disposal of the members by the Mayor and Corporation of Leamington. At noon the members of the Institute and those of the Warwickshire Archæological and Natural History Society were favoured with a public reception by the authorities of the borough, represented by the Mayor, Mr. John Fell.

This done, Lord Leigh, as President of this year's meeting, was placed in the chair in the room of Earl Percy, and delivered his inaugural address, Lord Percy introducing him with a few brief remarks on the marked difference between the objects of interest presented in Warwickshire this year to the Institute and those prehistoric objects to which they were introduced in Wiltshire last year. Lord Leigh, in his address, briefly recapitulated the chief points of attraction that would be seen at Broughton Castle, at Compton Wynyates, at Kenilworth, at Baddesley Clinton, at Stoneleigh Abbey and Church, at Warwick Castle and Guy's Cliffe, and, above all, at Stratford-on-Avon, where not only Shakespeare's bones were reverenced, but where to deny his claim to be the author of his dramas was held to be rank heresy and deserving of malediction among Warwickshire men. On the conclusion of the President's address, a vote of thanks to Lord Leigh was passed by acclamation.

After luncheon, the party found their way to the Great Western Railway Station, where a train was in readiness to take them to Stratford-on-Avon, to make the customary pilgrimage to the birth-place, home, and burial-place of William Shakspeare. On reaching Stratford they first inspected the great dramatist's birth-place in Henley-street, under the guidance of Sir A. Hodgson, Mr. Hawley, and the Rev. Mr. Laffan. This house is so well known to the general reader by description and by photography that it will hardly he necessary to describe it at any length. It is a low, antique building, probably of Early Tudor date, and consisting of a ground-floor and an upper story, with small, deep-set windows, and a roof of heavy, dark-red tiles. The house at various times suffered sadly by "improvements" and alterations from the appearance which it must have presented when Shakspeare was born, part of it being converted into the Maidenhead Inn, and the rest into a butcher's shop. It was in an upper room in this last-named portion, according to local tradition and the opinion of the learned, that Shakspeare first saw the light of day. The entire double house, after passing through several hands, from Susannah Hall, the poet's daughter, to whom he left it, was bought, about forty years since, by the public, and subjected to a very "conservative" restoration, which has had the effect of bringing it back very much to its original condition. The apartment which we first enter on the ground-floor is somewhat gloomy and dreary. It is low, and panelled with dark wood, and the windows are small. Its ample fireplace is probably as old as the house itself, and at it young Shakspeare, as a boy, must often have warmed his hands when he came home from the Grammar School, in Chapel-street, on winter evenings. We pass out of it and climb a winding staircase of dark wood and find ourselves in the chamber which is regarded as his birthplace. Everything here is ancient, and preserved with the most scrupulous care, and the room is lighter and pleasanter than the apartment which we left. Its walls, however, are rough and bare, and its fireplace is of a later date than the one below. But its walls were doubtless hung with tapestry or arras when Shakspeare's parents were its occupants, and that would have made it look more homelike. The walls and even the ceiling of this room are inscribed with the autographs of pilgrims from all quarters of the world who have inscribed their names with feelings of reverence; and, though the practice is one more honoured in the breach than in the observance, yet, as Washington Irving observes in his *Sketch-Book*, "these signatures present a simple but striking instance of the spontaneous and universal homage of mankind to the great poet of nature." A visitor's book is kept in the house, and in it may be seen the signatures of almost all the great literary lights of our century; and Sir Walter Scott has scratched his name on the window pane. In the room adjoining is a fine oil painting of the poet, thought to be original, a present from Mr. William O. Hunt, Town Clerk of Stratford. The garden behind the house is most carefully kept, and not a plant or flower is suffered to grow within it which has not been mentioned by Shakspeare. Some lines written on the wall of the apartment above-mentioned by Washington Irving in 1821, but long ago obliterated, were fortunately preserved and placed on record by a correspondent of the London *Standard*. They ran as follows:—

"Of mighty Shakspeare's birth the room we see,
That where he died in vain to find we try.
Useless the search—for all immortal he,
And those who are immortal never die."

The party inspected also the museum, which is enshrined in the other part of the house; in it are Shakspeare's high-backed chair, the fac-simile of his will, a collection of miscellaneous objects connected with himself and his poems, and portraits of his friends and interpreters.

A walk of five minutes or so, along the centre of the town, takes us to the Guild Chapel, dedicated to the Holy Cross, still standing close to New Place, or rather to its site, for New Place was pulled down by reckless and sacrilegious hands about the middle of the last century by its then occupant, the Rev. Francis Gastrell—a man whose name is still execrated in Stratford—the same who cut down the mulberry-tree planted by Shakspeare's own hands because he was annoyed by the frequent visits of pilgrims to the sacred spot. The mulberry-tree was cut up and made into snuff-boxes and other relics; but of New Place, where the poet spent the last eighteen years of his life, not a vestige remains.

The party lingered for a long time at the Grammar School, where within the last few months two frescoes have been found representing the union of the Red and White roses—an ornament probably set up in the newly-founded school on the accession of Henry VII. Here, and at the Guildhall Chapel, the Rev. Mr. Laffan showed himself a most able interpreter.

At the parish church, the party inspected the grave and bust of Shakspeare, which are so well known that we need not repeat a description of them; and those who had visited Stratford previously were glad to notice the recent removal of the side galleries. Precentor Venables, mounting the pulpit in the nave, gave a brief description of the fabric, showing that it was built at two different periods, in the thirteenth and fourteenth centuries, and pointing out how admirably the later artificers had wedded the new design to the old. The entire building, he remarked, very much resembled St. Mary's Church, Oxford, in some points, and in others St. Mary Redcliffe, at Bristol, especially in the panelling above the arches of the nave and below the clearstory. He trusted that before long the beauties of the north transept would be revealed by the removal of the organ.

The party, having halted at the fountain erected last year by Mr. G. W. Child, of the United States, in the Old Market-place, made their way to the station, and returned to Leamington in time for the evening meeting, when the Rev. Joseph Hirst opened the Antiquarian Section (of which he is the President) with a learned paper on the connecting links between the art of the Eastern nations and the art of Greece in its early period, which he showed to be found in the voyages of the Phœnician merchants. We are able to give here a portion of the paper:—

Archæology, as it is now understood, or the study of the monuments and relics of antiquity, was never pursued with greater ardour than in the present day. During the last century, and in the beginning of the present, classical antiquity was the object of serious study, and many admirable works, some remarkable for their colossal learning and exhaustive research, were published by the scholars of Europe in illustration of the history, laws, customs, and remains of classical antiquity. Great and important, however, as were these works, which will ever remain a monument of the industry, culture, and intelligence of their authors, they were based on a study of mere books and records, and on such inductions as might be drawn from a knowledge of the Present to unravel and unfold to us the history of the Past. It is only, to speak roughly, within the last quarter of a century that excavations have been conducted on a large scale, and the wrecks and monuments of antiquity have been investigated and studied on the spot. The information derived from actual contact with the tangible remains of the past, the sureness of touch gained by familiarity with visible structures, the light shed on the dark regions of antiquity by this new method of practical experience, can be better imagined than described. It is impossible to say how, by the aid of this decisive test of actual measurement of personal inspection, surmises were found to be suddenly changed into facts, theories erected on insufficient grounds were scattered to the wind, and many a cherished hypothesis based merely on induction from the present was banished for ever from the domain of science. Suffice it to recall the discoveries made in Assyria, Asia Minor, Egypt, Greece, Italy, and Cyprus, to give an idea of the extent and completeness of the information gained. The names alone of Nineveh, the Troad, Ephesus, Mycenæ, Tiryns, Epidaurus, Olympia, Eleusis, the Athenian Acropolis, Pompeii, and Rome, are enough to assure us of that re-birth of the knowledge of antiquity, and of that return of taste for and interest in the history of the past, which is the characteristic of the present generation. Nay, it may be said that we are but at the threshold of great revelations, and the awakened interest in antiquity of the cultured and educated classes of our age and country gives every promise of rising to the height of the occasion, and of preparing to make still further efforts to gain the prize within its reach, which is nothing less than that of bringing the peoples and places of ancient times within the field of actual observation. The societies recently founded for exploration in Egypt, Palestine, and Cyprus, and the Hellenic Society, the British School at Athens, and the Society of Biblical Archæology, are proof enough of this. Egypt and Palestine alone have every sign of bearing in their womb vast surprises for us. It is quite evident that the knowledge we have of these two countries is as yet in its infancy, and that we are on the eve of making on this yet almost unexplored area discoveries which will confirm the Bible records, and throw light upon its teachings. I am told by a great authority in Egyptology that, in spite of our many discoveries, we have as yet found no record in hieroglyphics of Moses, Joseph, or Jeremiah. But we must remember that it is only in the present century that we have begun slowly and painfully to spell out, as it were, the pictorial language of ancient Egypt; that the number of hieroglyphic records brought under our notice is as yet but small; that an immense number of papyri and of inscriptions are yet to be examined; but amongst the vast and little-known records of ancient Egypt we are almost sure sooner or later to find all that we want. Nay, cannot we even now triumphantly say that at last these hallowed names have, during the last few months, from Egyptian sources, been swimming into our view, thanks to the generous aid and to the efforts with pick and spade of some of our own members? The last half-century has seen revealed to us another ancient language,—that of Assyria,—and we are only now putting together the broken and scattered fragments of its cuneiform tablets, which carry us back in the information they give us to a period of history long anterior to that of Egypt itself. Many other languages of the ancient peoples, which occupied the countries round about the Mediterranean, are still as sealed books to us, and utterly unknown. When the languages of Phrygia, Caria, Lycia, Carthage, Iberia, and Etruria shall have become known to us, and their inscriptions and records read, how much information shall we not receive? During the present year Captain Conder has announced his discovery of the language that was common to the vast empire of the Hittites, and I have only just received news from Italy that Professor Polari is busy translating the old Etruscan inscriptions of Italy, having found a key to their interpretation in the little-studied Basque tongue. From this rapid survey it is evident to what direction the attention of our fellow workers throughout the world is now being chiefly directed. Indeed, the field of archæological study seems suddenly to have shifted ground, and to be transferred to deeper, wider, richer, and more important strata. Our minds seem to have been lifted out of the narrow sphere of home concerns, and of the region of our own country, and to have been transported to those vaster fields occupied by the nations of antiquity. The study of the monuments and customs of our own country will ever be of immense importance for the illustration of our own national history. But we must remember that we are only one of many nations, and that there is far away in the dim regions of the past, and calling for attention at our hands, an *aboriginal* history, of universal, or, as I may say, humanitarian interest, which concerns us all. Knit, as we all are, in one lasting brotherhood, we cannot but feel attracted to the origins of our race, which, more-

over, contain within them, in some way or other, the germs of all future separate, distinctive, and national developments in the many lands of East and West. The names of Leland, the prince of antiquaries, of Camden, Gale, Stukeley, and Horsley, and of our great county historians, will ever be held in honour, and their labours highly appreciated by us; but they themselves would have been the first to acknowledge, had the regions that are now being explored been known to them, and if the cities and monuments that have now been unearthed could have been visited and inspected by them, that these visible records of the past contain within them secrets of the utmost value, which were more deeply worthy of their attention. For in the far past are the seeds of the future, and it is only by investigating the first efforts of man in art and mechanism that we can thoroughly understand the after developments of Roman and Mediæval times, and indeed judge and estimate in a proper way the results we have attained to at the present day. It is in the intimate study of the monuments and remains of the ancient world, when man was feebly beginning to shape the records of his history on the native rock, or on granite or marble blocks, and to trace the fancies of his mind on moulded or on pictured clay, that we see those germs of light and beauty which were afterwards to dazzle us with their finished splendour, and to charm us with their incomparable grace on the Acropolis of Athens, and in the baths and palaces of Rome. In all sciences it is the origins of things that require our first attention, and the case is not different in archæology. May I be allowed, therefore, this evening briefly to draw your attention to that distant and hazy period when man's yearning and attempts after artistic expression were more in a state, we may say, of involution and potentiality, than of actual exercise and execution? It is by peering thus into a time when things were at their beginning, when ideas were assuming form, and forms were settling into shape, that we can come to assist, as it were, at the genesis of art, and by seeing from what it has come see also for what it is striving and whither it tends. A mere dilettante acquaintance with the monuments of antiquity, with ruins and sculptures and heirlooms from the battlefield or from the recesses of the ancient household, is not enough to satisfy the requirements of the modern mind. We live in an age of exact definitions and of scrupulous adherence to facts; when everything concerning man's physical existence upon earth must be brought to the test of accurate observation, and of strict, logical induction therefrom. If we would claim for archæology a place among the sciences, it must be on this condition, that it is studied in a proper and scientific manner with regard to the facts with which it deals. The rank of a science can be claimed by us for Archæology only on the condition that we take things at their origin, watch over their progress, and thus come to give every effort of fresh direction imported by the mind of man to architecture, to sculpture, to painting, and the growths and differences apparent in art, in warfare, and in domestic manners, each its proper place in history. And here I must say a word on another advantage to be derived from the study of archæology—its relation to history itself. I am about to introduce you to a period of the world, and to a scene of man's activity in Europe, dating from before the period when history began to be written. For the office of the antiquary precedes that of the historian. Long before the first literary effort of the historian, there were tools, arms, buildings, and monuments. The period of which we have here hung on the wall some striking specimens in these votive shields that have just been discovered in Crete, the illustrations of which I am now exhibiting in England for the first time, belong to the eighth century before Christ—to a period which, as contra-distinguished from the *pre-historic*, when there were no records whatever, and from the *historic*, when the first literary records began, we had best perhaps style *proto-historic*. An artistic culture flourished on the Island of Crete long before the time of Homer. There is no book, we may say of the "Iliad" and of the "Odyssey," where there is not mention of Crete. For its laws it is celebrated by Plato and by Aristotle. In Crete Plato lays the scene of his dialogue on laws. From Crete came the first artists into Greece. But we know that in Crete there were before the Greeks Phœnician colonies, and these were nothing else than so many emporiums or factories, whence the merchandise of the East was spread over the whole country. History tells us nothing of the actual period of which we speak. Whatever we know about this very ancient phase of Cretan civilization, and of the relations of this island with the East, and especially with Phrygia and Phœnicia, is the outcome of a number of notices and incidents scattered in Classical authors, which have to be tested by the discoveries of archæology. These deductions from the evidence of visible remains, whether in sculpture or in colour, together with the conclusions we can draw from a naturalistic or ethnological explanation of the most ancient myths, is all the information we can acquire about those primitive times. Hence the historian can now no longer dispense with the archæologist, and archæology is absolutely necessary for this archaic and unhistorical period in order to show forth the relations which the different peoples of the earth had then with one another, and to illustrate the high significance which all artistic productions have for the history of religion and the development of human thought.

Professor Clark moved a vote of thanks to Mr. Hirst for his paper.

The other paper, read by the Rev. George Miller, of Radway, treated at some length on the surviving specimens of early Church plate in Warwickshire; having searched the whole county round, he had found none of which he could be sure that it was of pre-Reformation date, though much was Elizabethan. The reading of the paper was followed by a long discussion, in which the Rev. Dr. Cox, Chancellor Ferguson, and Mr. George Lambert took part. Mr. Lambert expressed an opinion that some of the plate generally thought to have belonged to churches was really secular, and that further researches would probably bring to light in Warwickshire, as elsewhere, some specimens of date earlier than Henry VIII., though probably only a few. A vote of thanks was accorded to Mr. Miller for his paper.

On Wednesday nearly 100 members made an excursion to Broughton, near Banbury, the ancient moated castle of Lord Saye and Sele, and to Compton Wynyates, one of the seats of Lord Northampton.

We shall continue our report of the proceedings next week.

THE CROYDON WATERWORKS.

THE inauguration, on Thursday, the 2nd instant, of the well and reservoir of the new waterworks for the town of Croydon, by the Archbishop of Canterbury, was made the occasion for great rejoicings and festivities; and certainly, if the municipal authorities can succeed, as they hitherto have done, in reducing the rates as often as they increase their expenditure on public works, there will be few people inclined to find fault with their occasional rejoicings. It appears that, whilst in the past fourteen years no less than 147,000*l.* have been spent upon previous waterworks, upon recreation grounds and improvements in drainage, roads, and footways, the rates have come down from over 3s. 4d. to 2s. 5d. in the pound of assessed rental. Although the waterworks already in existence continue to give a large supply—last year over two million gallons per day—the increasing extension of the town has called for a large addition of water-supply available over the whole of the borough.

The new works have been carried out from the plans of the Borough Engineer, Mr. Thomas Walker, under the sanction of the Water Committee, of which Mr. Councillor Morland, J.P., is chairman. The well has been sunk into the upper chalk in an isolated hollow near Hare's Bank, a short mile in front of the Archbishop's Palace in the "wilderness" of Addington.

The surface level at this spot is 318 ft. above Trinity datum, and the well, 10 ft. in diameter, is sunk to a depth of 200 ft. At a depth of 142 ft. headings have been driven off from the well in various directions, by which means various important water-bearing fissures have been cut through and tapped, chiefly on the east side, and from which a water-supply of 2,491,000 gallons per day has been attained. The dimensions of these headings are 6 ft. by 4½ ft., and their total length is 813 yards. Their storage capacity, combined with that of the lower depth of the well, amounts to 502,000 gallons. The buildings, which consist of engine and boiler houses, are lofty and well-designed, and with the tall chimney shaft have a handsome appearance. The engine, which is fine and well-proportioned, and of 125 h.p., has been designed by Messrs. Easton & Anderson on the Woolfe type of compound beam-engines. The high-pressure cylinder is 20 in. in diameter and 4-ft. stroke; and the low-pressure cylinder, 34 in. in diameter, with a 6 ft. stroke. The two pumps are of the bucket and plunger type, 19 in. in diameter and 6-ft. stroke, delivering 72 gallons at each stroke. The long rod of one pump is attached to the beam, and descends to the depths of the well, lifting the water into the headings reservoir under the engine; and the other pump, attached to the piston-rod of the low-pressure cylinder, forces the water along 21-in. iron mains to the new reservoir on the Addington Hills, two miles nearer to the town,—the well being four and a half miles away from the same. The engine will make eighteen strokes per minute, and, therefore, will deliver 77,760 gallons of water per hour. The water, as pumped, has 16½ degrees of hardness. The three boilers are each 26 ft. long and 5 ft. in diameter, and work at a pressure of 100 lb. of steam. The buildings are so arranged that a second set of boilers and a second pumping-engine can be erected in them when required; and they are surrounded by four acres of ground fenced in, and upon which residences for the engine-driver and stoker have been built.

The new reservoir is very long and tortuous, the contour of the summit of the hill having been followed. It is constructed entirely of concrete, formed with the local pebbles of the Woolwich and Reading Tertiary strata, without puddle backing; and it is rendered water-tight by a coating of neat Portland cement. Its length is 420 ft. by 124 ft. wide, and 16 ft. 8 in. deep. Its capacity is five million gallons. It is covered by seven arches, with spans of 16 ft. and rises of 4 ft.; the sustaining walls (2 ft. thick) consist of piers and arches, and there is a division wall 12 ft. in height.

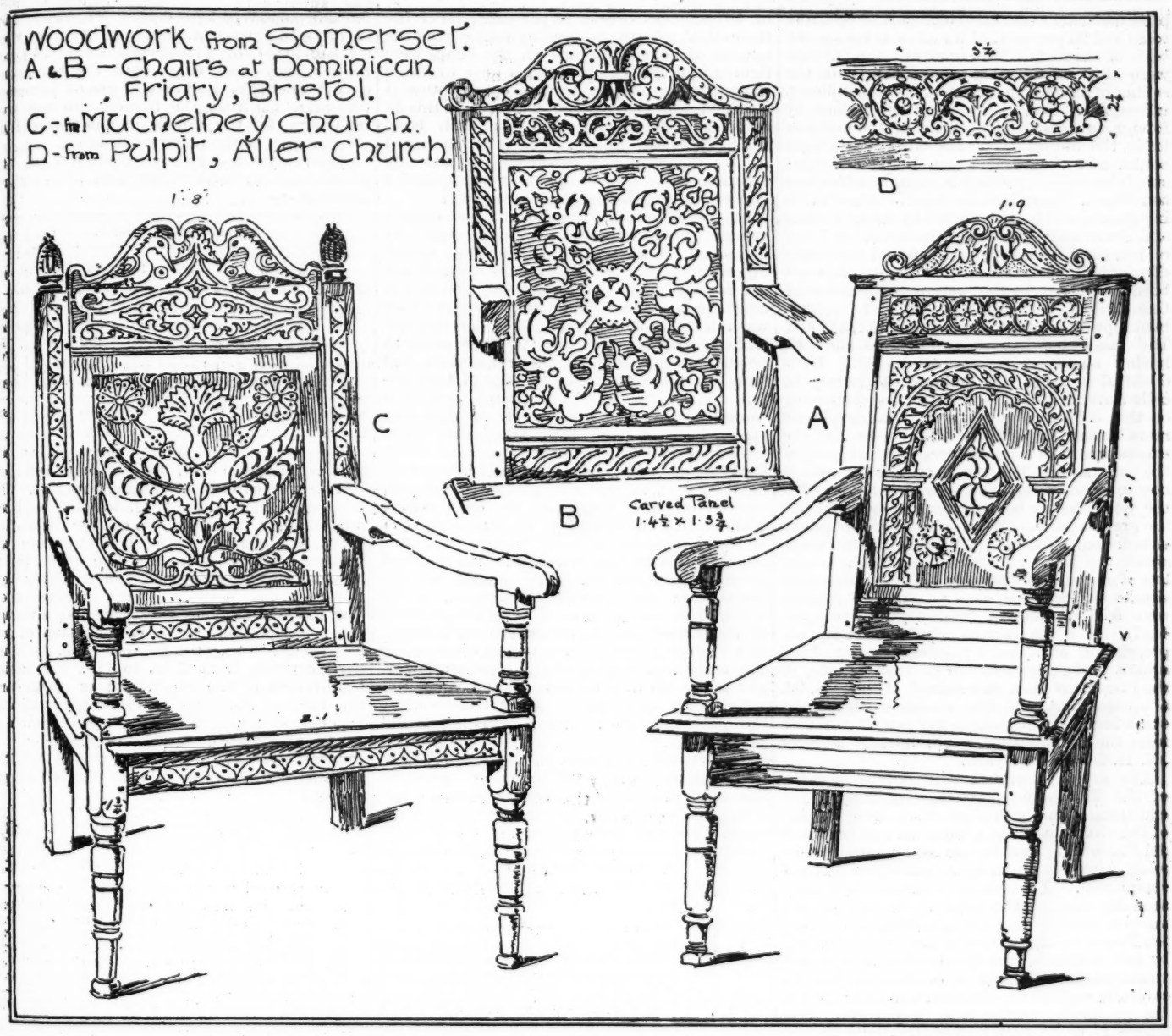
The outer concrete walls of the reservoir are 6 ft. thick at their base, battering to 4 ft. 6 in. at top; and over the covering arches there is spread 18 in. of earth. The level of the overflow is 465 ft. above sea-level, 100 ft. above the high-level tank on Park Hill, and 86 ft. above the highest road in the borough. The delivery main from the new reservoir is 18 in. in diameter to Coombe-lane, whence a 12-in. main runs off to the old reservoir, and a 15-in. main to Upper Addiscombe-road; a 12-in. forward to South Norwood, and a 9 in. to Upper Norwood new Town-hall. There are other branches, the total length laid being about thirteen miles and a half, and the weight of pipes 2,454 tons. The greatest pressure is in Portland-road, being due to a head of 345 feet.

A luncheon was given in a large canvas marquee on the Reservoir, at which the Mayor of Croydon, Mr. J. W. Hobbs, presided, and after which the Archbishop, who had previously started the engine at the well works, opened the valves of the reservoir main and turned the water-supply on to the town.

THE KENT ARCHÆOLOGICAL SOCIETY.

THE annual meeting of the Kent Archæological Society has just been held at Hythe. The members assembled in the Town Hall of the ancient borough on Wednesday, August 1st, when the routine business was despatched under the presidency of the Bishop of Dover, and many new members were elected. A visit was then paid to the stately parish church, which is now to be seen to great advantage, since the work of restoring the ancient vaulting of the choir and its aisles is now completed. The Rev. T. G. Hall and the indefatigable Secretary of the Society, the Rev. Canon Scott-Robertson, conducted the party over the church, and into the curious crypt beneath the easternmost portion of the chancel, which is filled with human bones. These are not of one time or people, but of many varying races. The members then proceeded in carriages to Lympne, the start being made in a steady downpour of rain, which, fortunately for the comfort of the members, speedily gave place to bright sunshine.

On arrival at Lympne, the ancient church was inspected, and portions of the edifice, erected by Archbishop Lanfranc, were pointed out. The building is, for the most part, a singularly plain example of First Pointed work, justifying the inquiry why a solid Early Norman church should have been almost rebuilt to give place to a fabric equally plain. The castle, adjoining the church, with which it makes a very effective group of buildings, con-



spicuous for many a mile across the flat land of Dymchurch Level, having been examined, the party proceeded to the point nearest to the ruins of Studfall Castle. These remains are those of an ancient Roman *castrum*, ruined by landslips, and now reduced to an irregular mass of disjointed masonry, banded by bright red Roman bricks.

Here Mr. Roach Smith, F.S.A., gave a brief and lucid narrative, not only of the present condition of the ruins, which were visible in the sloping ground, far below the feet of the party, but of the excavations made under his direction, to determine their nature. Proceeding onwards, Aldington Church was visited, and here the members were welcomed by the Rev. G. J. Blomfield. The building contains some good screenwork and stalls, and some late domestic panelling removed from Scots' Hall. The good Perpendicular tower was only completed in the reign of Queen Mary, but the base of a plain Saxon tower still exists in the south-west of the building, used as a vestry. The north side of the nave and chancel were found to be of the same early date, and there is also a tall, narrow doorway.

The remains of the old manor-house of the archbishops is close to the north side of the church. What has been a fine hall of the fourteenth century, with a circular coved roof, may still be traced, although divided into small bedrooms. At the evening meeting, papers were read by G. Wilks, Esq., town clerk, on Hythe Town and on Hythe Church, and Mr. Geo. Dowker read another upon the altered coast line at the supposed site of the *Portus Limanus*.

On Thursday, August 2nd, bright weather tempted a very large party to proceed on the day's excursion, the first stopping-place being Cheriton Church. There is here an elaborate and artistic chancel, built boldly on the slope of the hill. It contains some interesting brasses. The western tower is of great antiquity, doubtless of Saxon date. The openings consist of jambs and arches formed of small uncut stone. The age of the tower is attested by the fact that it is buttressed for support by buttresses of thirteenth century date, not bonded into the walls. A sham-fight was proceeding on the adjoining heights of Shorncliffe, and the church seemed to be undergoing a siege when the party was inspecting it. Newington Church was next visited. It is a very plain Early Norman fabric, enlarged in the twelfth century. Passing through beautiful country, progress was made to Lyminge Church (dedicated to St. Mary and St. Eadburga), which was fully described by the Rev. Canon Jenkins. The building stands on the site of a Roman villa, and, thanks to the Canon's exertions, the ground-plan has been traced in many places. The buildings have been of great extent, and a large semicircular apse has been traced. On the south side of the church, which contains Saxon work, as well as good examples of most of the later Gothic styles, are the foundations of a simple nave, ending in a semicircular apse. These are most probably the remains of the church occupied by the Saxon princess, Eadburga; but the work is clearly of earlier Roman date. It is composed of tile and masonry, the mortar being formed with pounded brick, and many fragments of wall decoration, in plain Pompeian red, have been met with. The party partook of hospitality in the adjoining rectory, where an interesting collection of antiquities was laid out for inspection.

The visitors left this remarkable spot with reluctance, and, carriages being resumed, progress was made to Saltwood Castle. This ancient residence of the Archbishops of Canterbury has recently been formed into a dwelling-house, by the engrafting of various new offices on to the old gateway, which has been entirely restored.* The remainder of the fabric has, fortunately, been left in an undisturbed state of ruin. After inspection, the party proceeded to the inner courtyard, where, surrounded by the ancient walls, they listened to a graphic description by Canon Scott-Robertson, who proceeded to identify the various portions of the castle. The members then dispersed, very well gratified by their inspection of many objects of interest situated in a county of very great beauty, which was seen to great advantage.

* For plans and views of the Castle, as restored, see the *Builder* for August 22, 1885.

WOODWORK FROM SOMERSETSHIRE.

UNDER this general title we give illustrations of three interesting Renaissance chairs, much alike in their general principle of design and construction, though varying in detail.

THE BUILDING TRADE IN ROME.

ACCORDING to the information given by the British Consul at Rome in a report dated June 13th last, "the year 1887 marked a period of serious trial in the economical and building progress of Rome. The main cause of the crisis as regards house-building was the want of both business capacity and capital on the part of the builders, who sprang up from the most different, and some from the most humble, classes of society, allured by the facilities afforded to the building speculation, and by the encouraging results which had been obtained in the past years of the building activity. Building-ground was then sold at reasonable prices, and a house, including the land on which it stood, used to cost 55 or 60 per cent. of the estimated value reckoned according to the average of rents, and builders could very easily sell at 70 or 80 per cent. of the estimated value, thus realising a profit of between 27 and 33 per cent. As the cost of building-ground increased, and the main conditions of the enter-

prise underwent a notable change, the cost rose to 80 and 90 per cent. of its value, taken on the basis of the rents. The profits of the builders were thus considerably diminished, and the selling of houses to investors became difficult, unless at a loss. The fears entertained by foreign bankers as to the state of the building trade, the limitation of discounts by the local banks, and the panic which seized the firms supplying building materials, brought difficulties to a climax. The sudden check in the sale of building-ground will be severely felt by the said banks and firms, one of which, at the end of 1887, had on hand 230,680 square yards of land nominally disposed of, but the transfer of which has not been carried out, by the fault of the purchasers. One builder, perhaps the foremost, became bankrupt with liabilities amounting to 2,000,000*l.* The class of builders is very numerous, one bank having amongst its customers 350. It is doubtful whether this state of things may be called over-building, when with the slackening of the construction of new buildings house rents became still higher. This shows that the extension of the town answers to a real want of the population. The construction of houses is now conducted with less feverish haste; still the work already begun proceeds regularly, and the greater part of the buildings are brought to completion. The cost of building-ground keeps about the same. In November, 1887, several lots of ground, amounting to 69,912 square yards, situate in the Prati, close to Castel S. Angelo, were sold by auction for 304,460*l.*, averaging 4*l.* 7s. 3d. a square yard. In May last the expropriation of a large palace, covering 3,756 square yards, situate in the centre of Rome, in the Piazza Colonna, was valued at 24*l.* 11s. 9d. a square yard, and the vendor accepted the condition of taking back a portion of the area from the Municipality at a minimum price of 25*l.* 1s. 7d. a square yard.

The works connected with the embankment of the Tiber are proceeding regularly. The embankment on both sides of the lower portion of the river from the Church of San Giovanni dei Florentini down to the Marmorata and the relative bridges are in a very advanced state of completion. The Ponte Garibaldi will very soon be open to the public. As regards the mode of constructing the new bridge to replace the Ponte Cestio, serious opposition was raised by the Archæological Commission, and it was arranged to demolish it completely, but to carefully undo the middle arch, so as to have it put up again on the new foundations. The bridge is to be partly reconstructed with the old materials, and is to maintain its present shape in all details.

The new drainage of the city is being conducted on a vast scale. A system of drainage and sewerage, worked on the same principle as that of London, collects the foul matter, which is carried away by a continuous current of water and ejected through the main sewers in the Tiber, far from the inhabited part of the town. It has, however, been discovered that in the quarters situated in the upper part of the town the drainage is in many ways defective."

THE AVERAGE METER SYSTEM FOR PUBLIC GAS-LIGHTING.*

The writer has been experimenting with regular gas-burners for some eighteen months, with a view to ascertain their reliability under various and varying pressures and conditions, and in the course of the experiments doubt has been raised in his mind as to whether the average meter system is necessary to a reliable and economical determination of the volume of gas consumed in the public lamps. His object in bringing the subject before the Association is to obtain the criticisms of the members on his conclusions, in order that the true system may be revealed.

The average meter system, as practised in the Metropolis, is briefly as follows:—Each lamp is provided with a regulator gas-burner which passes a definite quantity of gas per hour under the varying pressures in the mains; and at certain lamps, carefully selected by the gas company and the local authority, meters are fixed, which record the volume of gas burned. Each month the meters are read, and after striking out the returns of those which show a variation of 10 per cent. over or 10 per cent. under the theoretical volume obtained by multiplying the number of hours during which the lamps were lighted into the cubic feet per hour to which the burners are set, an average consumption is obtained for the selected lamps, and this is taken as the consumption for each lamp throughout the district. The question raised is, Are the regulator gas-burners sufficiently accurate to be relied upon for the quantity burned without the check of the meters?

In the following experiments, an experimental gas-holder and a minute clock by Parkinson were used. When the burner experimented on was fixed over the meter, it was not removed until the experiment with it was completed. In each experiment the gas-holder was filled with 5 cubic feet of gas, and was not refilled during the time, so as to secure as far as practicable gas at the same temperature and barometric pressure. The increase of temperature in the gas by the increased pressure is common to all the experiments, so that they give a basis of comparison when this slight error is neglected. The water-gauges on which the pressures were recorded were 4 in. below the regulators. The regulator gas-burners experimented on were bought in the open market without the knowledge of their makers, so as to avoid specially-prepared burners, and it is possibly due to this that the results obtained present discrepancies. The names of the makers are not stated in the paper, as the writer does not approve of using the platform of the Association as an advertising medium. The aim of the tests was to find out whether the regulators controlled the consumption of gas under varying pressures at the volume to which they were fixed. The pressures given are water-pressures: thus, 1 in. is ten-tenths pressure, &c.

Experiment 1.—Burner used was a 5-ft. fish-tail common burner, said to be a "regulator," but possessing no regulating apparatus whatever. The figures under the pressures give the number of cubic feet per hour:—

	Pressures in Inches.							Averages.
	1	1·5	2	2·5	3	3·5	4	
A	7·12	8·85	10·70	11·55	12·82	13·52	14·55	11·30
B	6·55	7·67	10·12	10·82	12·00	12·65	13·30	10·44
C	6·58	7·86	10·17	10·75	11·85	12·95	13·87	10·57
Av'rages	6·75	8·13	10·33	11·04	12·22	13·04	13·91	10·77

These results show that the burners are not regulators. The vertical column of averages shows the greatest variation to be 7½ per cent. The horizontal column of averages shows that the burners at 1 in. pressure passed 35 per cent., and at 4 in. pressure 178 per cent. more gas than they were marked to do.

Experiment 2.—Burner used was a 6-ft. bat's-wing common burner, said to be a "regulator," but possessing no regulating apparatus whatever.

	Pressures in Inches.							Averages.
	1	1·5	2	2·5	3	3·5	4	
A	8·87	11·05	12·87	13·77	14·77	16·25	16·70	13·47
B	7·70	10·03	11·50	12·75	14·10	14·95	16·22	12·46
C	8·40	10·85	12·20	13·20	14·52	15·50	16·55	13·03
D	9·38	11·52	12·42	13·65	15·00	16·10	17·90	13·71
Av'rages	8·59	10·86	12·25	13·34	14·60	15·70	16·84	13·17

The vertical column averages show the greatest variation to be 9 per cent., the horizontal column averages show that at 1 in. pressure the burners passed 43 per cent., and at 4 in. of pressure 181 per cent. more gas than they were marked to do.

Experiment 3.—Burner used was a 5-ft. public lamp regulator burner with a regulating apparatus.

	Pressures in Inches.							Averages.
	1	1·5	2	2·5	3	3·5	4	
A	5·82	5·51	5·55	5·47	5·36	5·16	4 98	5·41
B	5·33	5·30	5·23	5·17	5·08	4 85	4·60	5·08
C	5·43	5·47	5·31	5·15	5·05	5·03	4·85	5·18
Av'rages	5·52	5·43	5·36	5·26	5·16	5·01	4·81	5·22

The vertical column averages show the greatest variation to be 6 per cent., and show carelessness in manufacture. The horizontal column averages show that at 1 in. pressure the burners passed 10·4 per cent. more, and at 4 in. of pressure 4 per cent. less, gas than they were marked to do, or a total variation of 14·4 per cent. They also show that the regulating apparatus checks the waste of gas at increased pressures, but that the burners are not true regulators, for the volume of gas passed falls off gradually as the pressures increase.

Experiment 4.—Burner used was a 4-ft. public lamp regulator burner with a regulating apparatus:—

	Pressures in Inches.							Averages
	1	1·5	2	2·5	3	3·5	4	
A	4·27	4·57	4·47	4·48	4·45	4·47	4·47	4·45
B	4·18	4·35	4·37	4·32	4·25	4·35	4·36	4·31
C	4·33	4·43	4·50	4·40	4·41	4·40	4·37	4·41
D	3·95	4·06	4·11	4·32	4·22	4·06	3·87	4·08
E	4·30	4·31	4·29	4·32	4·28	4·30	4·12	4·28
F	4·31	4·35	4·40	4·40	4·37	4·37	4·38	4·37
Av'rages	4·22	4·34	4·36	4·37	4·33	4·32	4·26	4·32

The vertical column averages show the greatest variation to be 9·25 per cent., and show considerable carelessness in manufacture. The horizontal column averages, which reveal the reliability of the principle of the regulating apparatus, show that at 1 in. pressure the burners passed 5·5 per cent., and at 2·5 in. of pressure 9·25 per cent. more gas than they were marked to do. A study of the figures will show that the regulating apparatus is a good although not a perfect one. The consumption of gas increases with the pressure from 1 in. to 2½ in., and decreases from 2½ in. to 4 in., but, taking the average of the experiment as a standard, the burners show an excess consumption of 1·15 per cent., and a deficient consumption of 2·3 per cent.: which is a good result.

Experiment 5.—Burner used was a 4-ft. public lamp regulator burner with a regulating apparatus:—

	Pressures in Inches.							Averages
	1	1·5	2	2·5	3	3·5	4	
A	4·18	4·35	4·35	4·33	4·28	4·28	4·32	4·30
B	4·35	4·48	4·56	4·52	4·68	4·63	4·52	4·53
C	4·23	4·30	4·32	4·32	4·33	4·37	4·33	4·31
D	4·13	4·18	4·31	4·30	4·20	4·27	4·22	4·23
E	4·22	4·30	4·37	4·35	4·40	4·37	4·12	4·30
F	4·41	4·47	4·57	4·65	4·63	4·63	4·80	4·59
Av'rages	4·25	4·35	4·41	4·41	4·42	4·42	4·38	4·38

The vertical column averages show the greatest variation to be 8 per cent., and show considerable carelessness in manufacture. The horizontal column averages show that at 1 in. pressure the burners passed 6·25 per cent., and at 3 in. of pressure 10·5 per cent. more gas than they were marked to do. They also show that the regulating apparatus came somewhat slowly into action, but that for pressures of 1½ in. and upwards it as near perfect as can be expected; the variation from the average not exceeding 1 per cent. on either side.

Experiment 6.—Burner used was a 6-ft. household regulator burner with a regulating apparatus.

	Pressures in Inches.							Averages.
	1	1·5	2	2·5	3	3·5	4	
A	6·57	6·60	6·70	6·57	6·27	6·17	5·67	6·36
B	6·57	6·60	6·65	6·63	6·57	6·30	6·10	6·49
C	6·18	6·51	6·62	6·78	6·51	6·55	6·46	6·52
D	6·16	6·41	6·62	6·50	6·30	6·31	5·80	6·30
E	6·27	6·51	6·63	6·71	6·60	6·51	6·15	6·48
F	6·26	6·30	6·55	6·62	6·37	6·23	5·80	6·30
Av'rages	6·34	6·49	6·63	6·64	6·44	6·34	6·00	6·41

The vertical column averages show the greatest variation to be 3·4 per cent. The horizontal column averages show that at 1-in. pressure the burner passed 5·7 per cent., and at 2·5 in. of pressure 10·7 per cent. more gas than they are marked to do.

A number of other experiments were made, but they do not present new features, except the one which tested the burners to discover the pressures at which the regulators came into action. None of the regulators came fully into action at a pressure below six-tenths of an inch, and most of them at eight-tenths. The nett result of the experiments given is that regulator gas-burners can be made which will not vary in their consumption of gas at pressures varying from 1 in. to 4 in. more than 1·15 per cent. fast and 2·3 per cent. slow of

* A Paper by Mr. Geo. R. Strachan, Assoc.-M. Inst. C.E., Surveyor to the Vestry of Chelsea, read at the annual meeting of the Association of Municipal and Sanitary Engineers and Surveyors, recently held in London, as previously mentioned (see *Builder*, p. 44, *ante*).

their average consumption. All that is necessary therefore is to get the regulator accurately set, and its limits of error are known. The Metropolis Gas Act, 1859, defines a meter as correct which does not register more than 2 per cent. fast and 3 per cent. slow. The gas-room tests given herein show that regulator gas-burners can be made as correct as gas-meters.

The question now arises, Do regulator gas-burners in use on public lamps, where exposed to all weathers, temperatures, and barometric pressures, give equal results to those found in the testing-room? The writer is honoured by Mr. Philip Monson, the gas superintendent for the parish of Kensington, placing at his disposal the results of the average meter system for eleven years. Each lamp has a regulator burner set to burn 4·5 cubic feet per hour. The meters are read each month, and the records have been carefully collected. More than 4,000 lamps are in lighting on the meter system. The following table shows the average consumption per lamp per hour for each of the eleven years.

1877	4·55	cubic feet per lamp per hour.
1878	4·57	,, ,, ,,
1879	4·50	,, ,, ,,
1880	4·43	,, ,, ,,
1881	4·46	,, ,, ,,
1882	4·50	,, ,, ,,
1883	4·48	,, ,, ,,
1884	4·49	,, ,, ,,
1885	4·49	,, ,, ,,
1886	4·52	,, ,, ,,
1887	4·54	,, ,, ,,
11)	49·53	,, ,, ,,
Average	4·503	,, ,, ,,

These results are a convincing proof that regulator gas-burners may be relied upon in actual use. The writer has compiled the following table from Mr. Monson's records, showing the average consumption per lamp per hour for each month of the eleven years :—

January.....	4·38	cubic feet per lamp per hour.
February	4·51	,, ,, ,,
March	4·45	,, ,, ,,
April	4·53	,, ,, ,,
May	4·49	,, ,, ,,
June	4·61	,, ,, ,,
July	4·60	,, ,, ,,
August	4·53	,, ,, ,,
September.....	4·53	,, ,, ,,
October	4·49	,, ,, ,,
November	4·50	,, ,, ,,
December	4·39	,, ,, ,,
12)	54·01	
Average	4·501	,, ,, ,,

It will be noticed from this table that the lowest consumption occurs during those months when the hours of lighting are longest, and that this gives an advantage to the local authority if the average meter system is adopted. The following table, based on 4,300 hours' lighting per year, shows the amount of this error :—

Month.	Hours of Lighting	Cube Feet per Hour.	Total Cubic Feet per Lamp.
January.....	484·03	4·38	2120·0514
February	397·75	4·51	1793·8525
March	375·58	4·45	1671·3310
April	303·90	4·53	1376·6670
May	260·41	4·49	1169·2409
June	224·52	4·61	1035·0372
July	246·30	4·60	1132·9800
August	294·01	4·53	1331·8653
September	341·90	4·53	1548·8070
October	414·67	4·49	1861·8683
November.....	454·95	4·50	2047·2750
December	501·98	4·39	2203·6922
Totals, &c.....	4300·00	4·50	19,292·6678

If the consumption had been taken from the burners alone, it would have stood at $4300 \times 4{\cdot}5 = 19{,}350$ cubic feet per lamp per year, as against 19,292·6678 cubic feet given by the meters, or an error in favour of the gas company of 57·3 cubic feet per lamp per year. In London the price of gas to public lamps north of the Thames is 2s. 2d. per 1,000 cubic feet, so that the saving to the local authority for gas by the average meter system is 1½d. per lamp per year.

Against this there is the cost of the average meter system. The following figures refer to a district containing 4,000 lamps with a meter to every 20 lamps.

Capital Expenditure.

	£.	s.	d.
200 meters fixed complete at 7*l.* 10s. each	1,500	0	0

Annual Expenses.

Interest, depreciation, and repairs on meters, 10 per cent. on 1,500*l.*	150	0	0
Man's time reading meters: 12 weeks per year at 25s. per week	15	0	0
	165	0	0

This cost, divided over 4,000 lamps, equals 9·9d. per lamp per year, which is incurred to save 1·5d. per lamp per year.

The figures given refer to a district where the minimum parliamentary limits of pressure are ten-tenths from sunset to midnight, and six-tenths from midnight to sunrise. As a matter of fact, however, the actual pressures are in excess of these limits. From the continuous recording pressure-gauge in the testing-room at Chelsea, it is found that the pressure does not get below 1·2 in. at any part of the day, and that from one hour before sunset to half an hour after, the pressure rises to 3 in., and even more, and then gradually falls to 1·4 in. by midnight. Where pressures like these are given, the writer is of opinion that the average meter system is an unnecessary check and expense. It may be that in small districts the pressures fall below those stated as the parliamentary limits, and in such cases the regulator burners will not pass their full quantity. The remedy, however, is to make the gas company give a proper pressure, and so save the expense of the meters.

THE METROPOLITAN BOARD OF WORKS INQUIRY COMMISSION:

FURTHER EVIDENCE.*

SIR JOSEPH BAZALGETTE, further examined, said that the granite for the Thames Embankment came from various quarries, in none of which had he, nor any member of his family, the slightest pecuniary interest. There was a Royal Commission a few years ago upon the question of the mode of dealing with the London sewage. The Commission reported that the deodorising of the river by pouring chemicals into the sewage was only a temporary palliative. The Board was now erecting new works at the Barking and Crossness outfalls, which were intended to carry out the first part of the recommendations of the Royal Commission. The Royal Commission were of opinion that when the solid matter was precipitated the effluent would not be pure enough to go into the river without being passed through land. But the Board were now carrying out the first part of the Royal Commission's recommendations, in the hope that it might be successful, or that some cheaper mode of producing a purer effluent might be found, if necessary, instead of having to purchase the very large area of land that would be required for filtering the water. The sludge was to be taken away right out to sea in specially-constructed ships, and there discharged; but the Board were fully alive to the advantage that might be gained if it were possible to produce a deposit which could be sold and used as manure. But they were not very sanguine of being able to do that. Asked by Mr. Bosanquet as to the cost per annum of the chemicals used by the Board for the deodorisation of the sewage, Sir Joseph Bazalgette replied that one year the Board spent 80,000*l.* in chemicals, but that was during a very hot season, when there were very great complaints of the state of the river. They were then using manganate of soda, and that was simply to arrest the decomposition, and not for the purpose of removing the sludge. In answer to the Chairman, the witness said that the contracts for the chemicals were made with various firms. That was a matter mainly in the hands of the Chemist of the Board, but he (witness) was jointly responsible with that officer. When they began they had to pay about 40*l.* per ton for manganate of soda, but they set to work and manufactured it themselves at Crossness; they manufactured it at a very greatly reduced cost, and brought the price down in the market very largely, until, at last, the manufacturers supplied it to them at a lower rate than they could produce it at for themselves. He believed the Board was now paying about 14*l.* per ton for it instead of 40*l.* as formerly. Examined by Mr. Bosanquet, witness said the Board had not been spending so much as 80,000*l.* a year for chemicals; the year to which those figures pertained was an exceptional one. This year there had been a wet and cold season, and the Board had done very little with the chemicals; in fact, they had now stopped it. Sir Henry Roscoe was now the advising Chemist of the Board, and under his advice the use of chemicals had lately been stopped. In answer to the Chairman, witness said that Sir Henry Roscoe had not advised a permanent stopping of the use of chemicals, but he was watching the state of the river from day to day, and would vary his order if necessity arose. Asked by the Chairman as to the Board's procedure in regard to the provision of bridges, tunnels, or ferries across the river below London Bridge, Sir Joseph Bazalgette said it was in the year 1882 that he was instructed to report generally upon the question of communications across the Thames below London Bridge. In his report he pointed out that whilst there were twelve bridges above London Bridge, and three-fifths of the population in immediate communication with those bridges, the other two-fifths of the population living on the river sides below London Bridge had no communication across the Thames. The twelve bridges referred to cost altogether about 6,500,000*l.*, and the people below bridge had contributed towards that cost. It was thought reasonable, therefore, that they should have proper communications across the river provided for them. Witness, in his report to the Board on the subject, recommended three points of crossing, the first at the Tower, the second at Shadwell, and the third at Blackwall. The two latter points,—Shadwell and Blackwall,—were chosen because they were the only two points at which the river could be crossed without coming in contact with docks on one side or the other. The Corporation of London were now constructing a bridge at the Tower, and the Metropolitan Board of Works were just about to commence the tunnel at Blackwall. The Greenwich Subway was quite a different project to the Blackwall Tunnel. The Greenwich Subway was a subway for which private parties got an Act about the year 1883. They proposed to the Metropolitan Board of Works that they should take that subway, and they would construct it on payment of a sum of 126,000*l.* That sub-way was to be 10 ft. in diameter, with inclines of 1 in 12 at each end, and steps to get up to the shore. That would have been a very useful subway for workmen to get across, but as a public means of communication it would be quite inadequate. The Company then proposed to the Board that they should add to that another subway, which would have a roadway 17 ft. wide, upon the Board paying the sum of 400,000*l.*, but it was so situated that the approaches could not be made to it, and it was to have hydraulic lifts at each end. The cost of working these hydraulic lifts, with a very moderate amount of traffic, was put at 3,000*l.* per year, but they would cost a great deal more. The Board were going to construct a tunnel, or rather, three tunnels, at Blackwall, which, instead of giving 17 ft. and 8 ft., making together 25 ft., would give 50 ft., made up of two 18 ft. 6 in. roadways and a 13 ft. roadway. This series of tunnels would have good approaches from Woolwich and Greenwich on the one side of the river, and from East India Dock-road and the East India Docks on the other. The gradients would be 1 in 40. The estimated cost of this work was from 1,250,000*l.* to 1,500,000*l.* In answer to Mr. Freeman, one of the counsel representing the Board, Sir Joseph Bazalgette said that there was very considerable difficulty to be encountered in constructing the tunnel, which passed through treacherous ground and water. They intended to do it by pneumatic pressure. They proposed to construct the smaller tunnel first, in one contract, with approaches, at a probable cost of 200,000*l.* They thought they should learn then better how to do it. The contract had not yet been entered into for this work, but some of the land required had been purchased. Questioned by Mr. Bosanquet, witness said that for all works tenders were invited by advertisement. Anybody might tender for any of the Board's works. All tenders were opened at the Board by the Chairman, and not by witness or any other official. Nothing had yet been done with respect to the proposed Shadwell subway.

Mr. Matthew Goddard, re-called, gave some further evidence as to transactions between himself and the occupiers of some of the Board's public-houses.

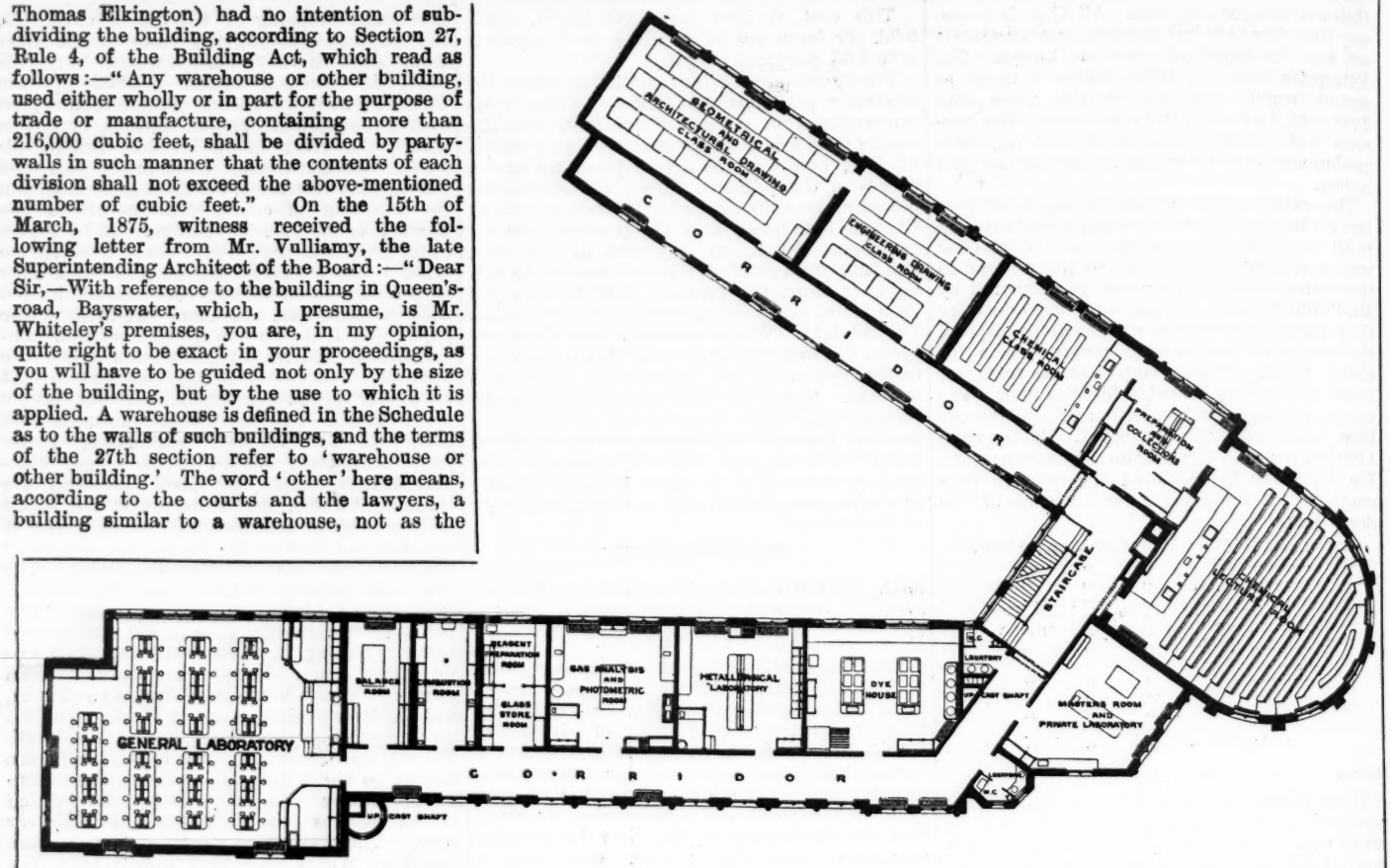
Mr. Horace Gundry, F.R.I.B.A., District Surveyor for Paddington, deposed that in March, 1875, he made a report to the Board with reference to a building which was being erected in his district, viz., "Whiteley's," in Queen's-road, Bayswater. His report was addressed to Mr. Vulliamy, and drew attention to the fact that the warehouse in question contained about a million cubic feet, and that, as far as could be ascertained, the builder (Mr.

* For summary of previous evidence see the *Builder*, pp. 8, 44, 66, 83, *ante*.

Thomas Elkington) had no intention of subdividing the building, according to Section 27, Rule 4, of the Building Act, which read as follows:—"Any warehouse or other building, used either wholly or in part for the purpose of trade or manufacture, containing more than 216,000 cubic feet, shall be divided by party-walls in such manner that the contents of each division shall not exceed the above-mentioned number of cubic feet." On the 15th of March, 1875, witness received the following letter from Mr. Vulliamy, the late Superintending Architect of the Board:—"Dear Sir,—With reference to the building in Queen's-road, Bayswater, which, I presume, is Mr. Whiteley's premises, you are, in my opinion, quite right to be exact in your proceedings, as you will have to be guided not only by the size of the building, but by the use to which it is applied. A warehouse is defined in the Schedule as to the walls of such buildings, and the terms of the 27th section refer to 'warehouse or other building.' The word 'other' here means, according to the courts and the lawyers, a building similar to a warehouse, not as the sense might be if the word 'any' had been substituted. It takes a general meaning. The same rule applies to section 56." The Chairman (Lord Herschell) said he did not know whose law that was, because the words were "any warehouse or other building used either wholly or in part for the purpose of trade or manufacture." He did not know that a building used for the purpose of a manufactory could be *ejusdem generis* with a warehouse; he should think it could not be possible; it was another *genus* altogether. Further correspondence between the witness and Mr. Vulliamy was read, and ultimately the witness saw Mr. Vulliamy on the subject of taking proceedings against the contractor, as the building was being covered in. The matter had previously been referred to the Building Act Committee for consideration and report. Witness was anxious to commence proceedings against the builder as early as possible, so that the builder might not complain that he had been led into unnecessary expense by being allowed to go on so long. Mr. Vulliamy said it would be a very awkward thing to commence proceedings while the matter was under the consideration of the Board, and that such a course would not be respectful to the Board. Mr. Saunders, then a member of the Board, was Mr. Whiteley's architect, and Mr. Whiteley's solicitor was Mr. Roche, then also a member of the Board. Witness said that although the builder, in the usual notice, called the proposed building "a warehouse for furniture," it was endorsed at the back "I am instructed by my client that this building is to be used as a furniture shop for sale by retail, as in his other establishments. J. Ebenezer Saunders." Witness did not know whether Mr. Saunders was at that time a member of the Building Act Committee of the Board.

We must break off here.

Proposed Cathedral in New York.—It is stated in the newspapers that several of the most eminent American architects have been invited by the trustees of the proposed cathedral to submit plans for an edifice "which shall be the largest, costliest, and most enduring church structure in the United States." The cathedral, to be dedicated to St. John the Divine, will be built on land near the Hudson River. The exterior is to be of marble or granite, and "no inflammable material is to be used in its construction."



PLAN OF PRINCIPAL FLOOR

Competition Design for Blackburn Technical Schools.—Messrs. Spalding & Auld, Architects.

COMPETITIONS.

Church and Mission Hall, Kensal Town.—We understand that the design of Messrs. Demaine & Brierley, architects, York, has been selected for a new church and mission-hall for the newly-formed parish of St. Thomas, Kensal Town. The estimated cost is 5,500*l.* Five London architects were also invited, and submitted designs.

Institute and Gymnasium, Buckingham Palace-road.—We are informed that in the limited competition for the Buckingham Palace-road Institute, Gymnasium, lecture and music-rooms, &c., a professional assessor selected plans by Mr. Edward Francis C. Clarke, of Westminster-chambers, who was accordingly appointed architect to the buildings.

Illustrations.

MEMORIAL STATUE OF THE LATE CARDINAL GIRAUD.

THIS statue, of which we give an illustration, is from the chisel of the eminent French sculptor, M. Crank: it is executed in marble, and is to be erected in the Cathedral of Cambrai, as a memorial of the late Cardinal Giraud, who was also, we believe, Archbishop of Cambrai.

The statue was exhibited in the Paris *Salon* of this year, and was referred to in our article on the *Salon* as one of the prominent works of the year.

THE WALLACE STATUE, ABERDEEN.

WE give an illustration of this work, which has been carried out by the aid of a bequest of £3,000 left for the purpose by the late Sir John Steell, the sculptor, of Edinburgh. Twenty-five sculptors sent in models in competition for the work, and the trustees, with the co-operation of Sir Noel Paton and Dr. Rowand Anderson, selected the one by Mr. W. Grant Stevenson, by whom it was modelled to a large scale, and cast in bronze by Messrs. Young & Co., of Pimlico. The statue is colossal in scale, standing 16 ft. in height, on a pedestal of rough rusticated stonework, or rather rock-work.

The statue was unveiled on June 29 by the Marquis of Lorne.

COMPETITION DESIGN FOR BLACKBURN TECHNICAL SCHOOLS.

THIS design, of which we give the perspective view and plan, was the one sent in under the motto "Progress," and referred to by us in our review of the designs as one possessed of very high merits, and which to us seemed to have been unduly overlooked. The authors are Messrs. Spalding & Auld. They claim that the plan is one that would utilise the site to the best advantage; "the position is such that nothing could be gained by setting back the building; on the contrary, a good corner affords opportunity for picturesque treatment."

The method of placing the corridor on the south of each wing, instead of running it symmetrically round, shows a consideration of the best conditions of lighting for rooms in which continuous work is to be done, which is, we regret to say, by no means usual in competition designs, as observed in our notice of another competition in the present number.

The authors make a comment on the recent not unfrequent practice of issuing an assessor's "sketch plan" with instructions to competitors, which seems not uncalled for. They say:—

"In this, as in many recent competitions under an assessor, an assessor's sketch plan has been issued with the 'Instructions and Conditions of Competition.' Naturally, a large proportion of the competitors in such cases at once adopt the plan suggested. It 'flatters' the assessor and saves them the trouble of working out a plan of their own. The system, however, places at a great disadvantage any independent effort to bring out all the possibilities of the site when the results have to be submitted to one having preconceived ideas on the subject."

It is a fact that in this case the assessor, in his report, remarked that he was "flattered" that so many of the competitors had adopted his idea as to the plan, and he gave the first premium to a design based on his general idea of the plan. This is quite natural: the assessor's sketch plan is sent forth as the principle of arrangement which he thinks the best, and it is not unlikely that he should continue to retain this opinion. But it is, as Messrs. Spalding & Auld say, rather unfairly handicapping the competitors who have an original idea of their own, and it is a question whether the "assessor's sketch plan" is altogether a wise institution.

HOUSES, Nos. 7 to 11, CHEYNE WALK, CHELSEA.

THESE houses occupy the site of some old and historical houses built on the site of the "Great Garden" of Winchester House, forming part of the Manor House (Henry VIII.'s Palace) of which this building was a continuation, fully described in the "Village of Palaces," by L'Estrange. The houses, seven in all, and one of which was well known as the Gothic House, it having been altered and remodelled by the elder Pugin, had for the most part fallen into decay, and, the leases having expired, it was decided to rebuild according to modern requirements.

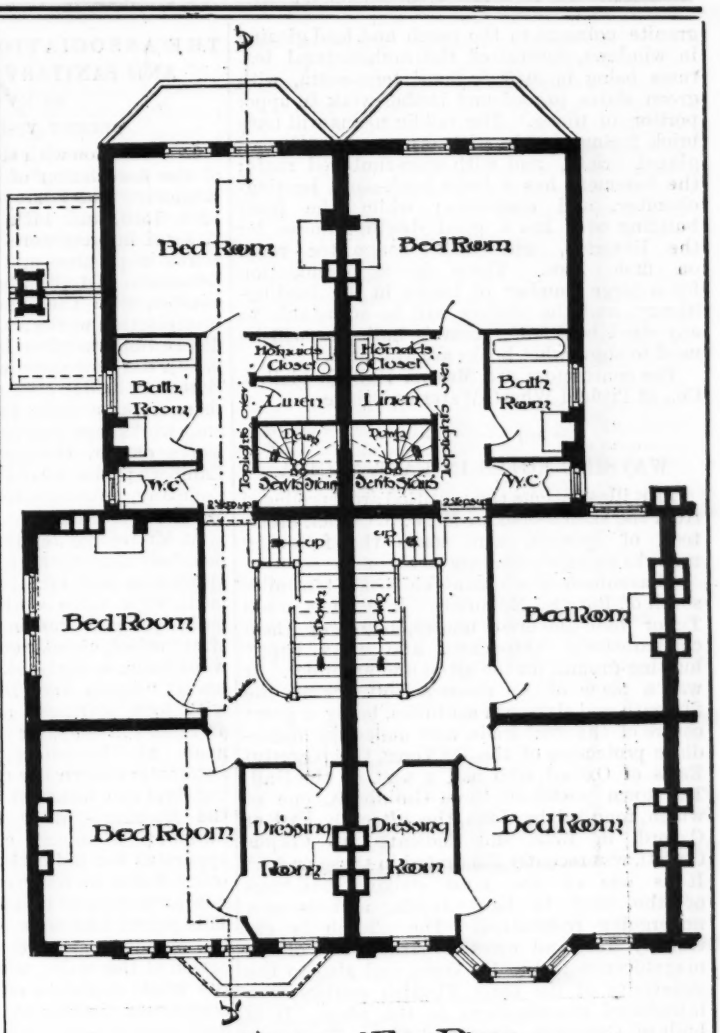
A reference to the plans of these new houses will show that an innovation has been made in the arrangement of the ordinary London back-addition house. This improvement is chiefly confined to the ground-floor, and consists in the mode of arranging hall, staircase, entrance, and two rooms.

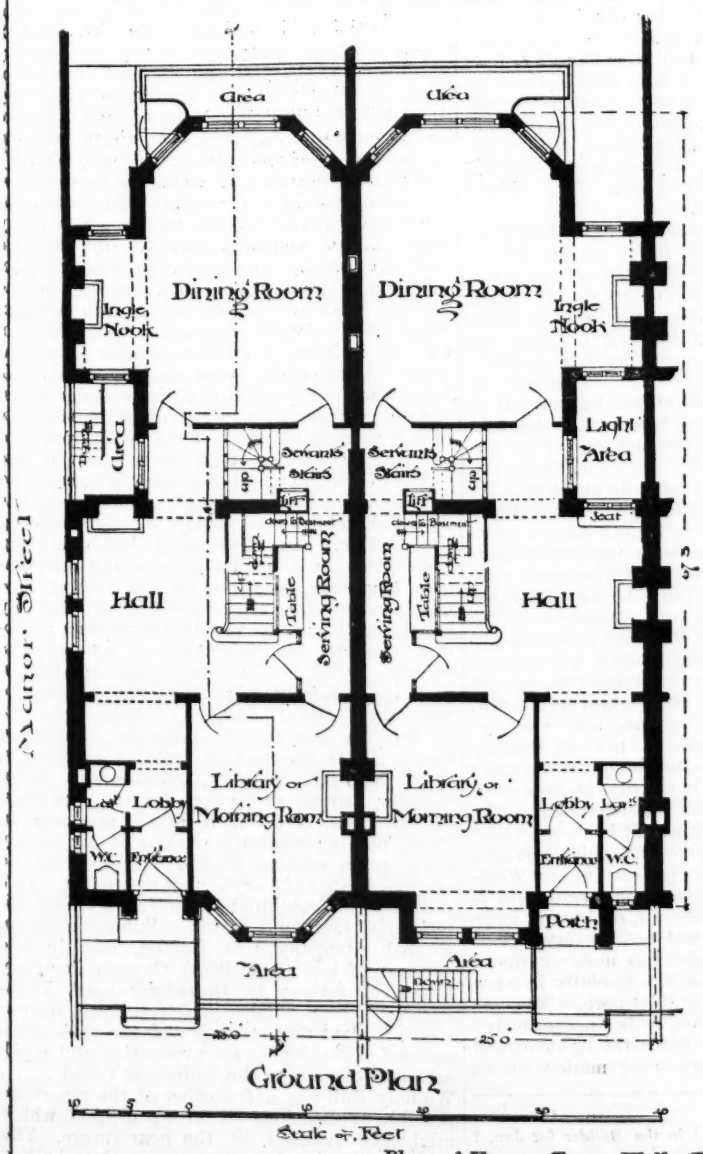
The ground-floor consists of morning-room or library, and a dining-room; between these two rooms is placed a large inner hall and staircase, the staircase being placed on the opposite side and out of the view of the front entrance. The staircase from ground to first floor consists of three easy flights, under which is formed a serving-room, with doors communicating to the two rooms, and a way down to the basement. A lift is also provided from kitchen to this servery. A servants' staircase, which reaches from basement to second floor, has also been provided. The first floor consists of front and back drawing-room and billiard-room or boudoir. The second and upper floors contain eleven bed-rooms, with dressing and bath-rooms, &c. The accommodation in the basement is very ample, and all rooms, staircases, and passages are thoroughly well lighted and ventilated. Externally the houses are faced with red-bricks, the general treatment being simple, so as to harmonise with the adjoining houses, which are very good specimens of the architecture of their day. F. HEMINGS.

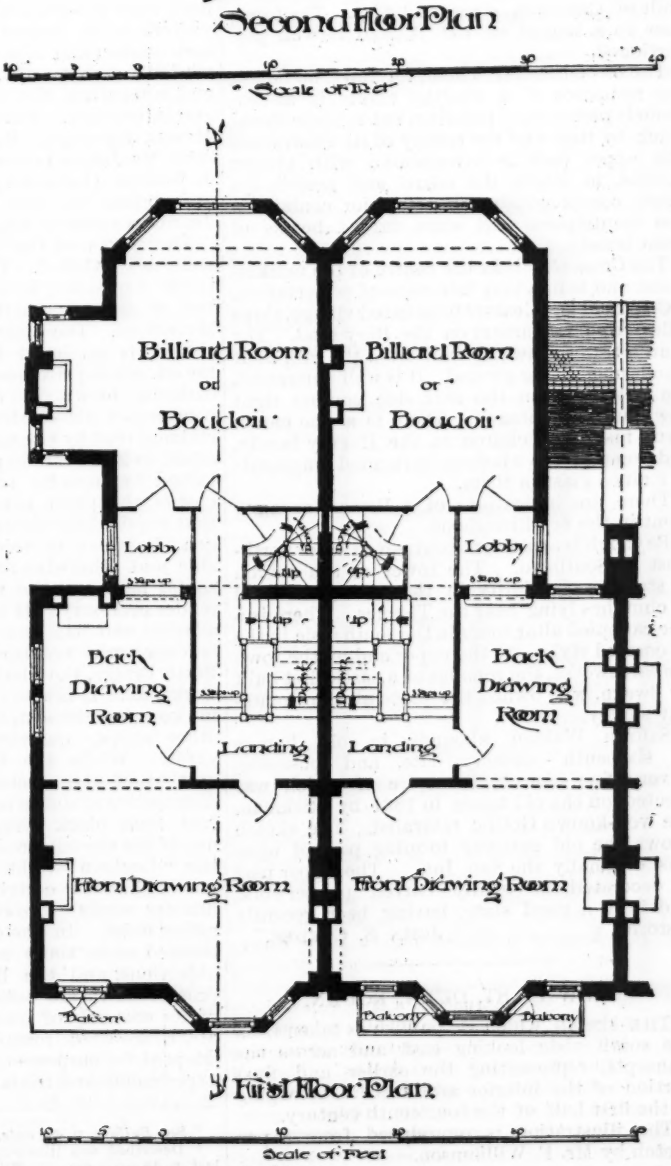
NEW DURNING LIBRARY, LOWER KENNINGTON-LANE, LAMBETH.

THIS is one of the new free libraries which are being built for the parish of Lambeth, for the Lambeth Libraries Commissioners, from the designs of their architect, Mr. Sidney R. J. Smith.* The whole cost of the building and site (about 10,000*l.*) has been defrayed by Miss J. Durning Smith. The front of the building will be constructed with red Fareham bricks and Portland stone, with

* For illustrations and descriptions of two other of the Lambeth Free Libraries, those, namely, at Norwood and in the South Lambeth-road, see the *Builder* for Sept. 24 and Dec. 17, 1887, respectively.







Plans of Houses, Cheyne Walk, Chelsea.—Mr. F. Hemings, Architect.

granite columns to the porch and lead glazing in windows, several of the architectural features being in Stiff & Sons' terra-cotta, with green slates to roof and timber-work in upper portion of tower. The public rooms will have brick facings inside, with ornamental coloured glazed bricks, and with open-timbered roofs; the basement has a large book-store, heating-chamber, and coal-store; while the front building over has a good dwelling-house for the librarian, and with committee-room on first floor. There is accommodation for a large number of books in the lending-library, and the shelves will be adjustable to any sized book. Cotgreave's indicator will be used to show what books are available.

The contractors are Messrs. Hall, Beddall, & Co., of Pitfield Wharf, Waterloo Bridge.

WAYSIDE NOTES IN EAST ANGLIA.

THE illustrations thus entitled are reproduced from the sketch-book of Mr. J. S. Corder, architect, of Ipswich, who sends the following remarks as supplementary to them:—

"Lavenham is a quaint old town ten miles south of Bury St. Edmunds. It abounds in old Tudor half-timbered houses, many of them comparatively untouched, and is a happy hunting-ground for the artist and architect. It was a place of no mean importance in the fifteenth and sixteenth centuries, being a great centre of the wool trade, and under the immediate protection of the De Veres, the powerful Earls of Oxford, who had a seat at the Hall. The town possessed three Guildhalls, one of which, founded by John, the fifteenth Earl of Oxford, in 1529, and dedicated to Corpus Christi, was recently illustrated in these pages.* It is one of the most striking buildings of the kind in East Anglia, and is now undergoing restoration. The church is extremely fine, and owes a great deal of its magnificence to the De Veres, and also to the generosity of the early Flemish settlers, who introduced manufactures to the place. It is built of Casterton stone and flint. The tower rises to a height of 141 ft., and is well proportioned.

The old Grammar School, formerly, no doubt, the residence of a wealthy trader, is an extremely picturesque building, but it has suffered much by time and the energy of its renovators. The upper part is ornamented with plaster designs, in which the mitre and fleur-de-lys figure conspicuously. The interior contains a fine mantelpiece and some carved beams of great beauty.

The Cross stands in the centre of the market-place, and is in a very fair state of preservation.

Cockfield is a pleasantly-situated village, three miles from Lavenham on the Bury road. The church tower shows up well from the rail, as it stands upon rising ground. It is well buttressed, the buttresses on the east side coming right down into the church. There is a fine monument inside the church to the Harvey family, and some of the windows have good fragments of stained glass in them.

There are indications of a Roman encampment in the neighbourhood.

Rayleigh is an ancient town seven miles north-west of Southend. The tower of the church is stone, a peculiarity in this county confined to churches lying near the Thames. There is a fine canopied altar tomb in the south aisle in the Decorated style. At the upper end of the town are earthworks, the remains of a castle first built by Sweyn, who owned the place at the Domesday survey.

Saffron Walden abounds in old houses of sixteenth-century date, and possesses a very fine church, the spire of which was erected on the old tower in 1831 by Rickman, the well-known Gothic revivalist. The sketch shows the old gateway forming part of what was originally the Sun Inn. The upper part is decorated in boldly-carved plasterwork, and is in a good state, having been recently restored. JOHN S. CORDER."

VIEW IN ST. OUEN, ROUEN.

THE sketch which we publish is taken from the south aisle looking east and across the transepts, representing the earlier and finer portion of the interior architecture, belonging to the first half of the fourteenth century.

The illustration is reproduced from a pen sketch by Mr. F. Williamson.

* See *Builder* for April 28 last.

THE ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS:

RECENT VISITS TO WORKS.

IN connexion with the recent annual meeting of the Association of Municipal and Sanitary Engineers and Surveyors, held in London on 12th, 13th, and 14th of last month,* several visits of interest were made by the members to works in progress and to manufacturing establishments. Of the works in progress, the most notable were the new metropolitan sewage precipitation works at Barking (of which a full description was given in the *Builder* for July 28, p. 60), the new Greenwich Ferry, and the new Battersea Bridge; we give brief descriptions of these works a little further on. The factories and workshops visited included the sanitary works of Mr. George Jennings, at Stangate, Lambeth; the works of the Lucigen Light Company, Westminster; and Brin's Oxygen Works, Westminster.

At Mr. George Jennings's busy workshops the members were shown a large variety of sanitary appliances and fittings, including a new spray bath, with valve worked by the foot of the bather; a new flushing-rim slop sink; a new street urinal, circular on plan, with strong stone-ware basin, salt-glazed, in lieu of the usual iron basin; "tip-up and lift-out" lavatory basins, with lock bearings; a spray bath, lavatories, and other fittings, for a new bathing establishment at Barcelona; an arrangement of automatic cistern for charging with disinfecting fluid the water of street watering-vans, or the flushing-water of sewers and house-drains;† Jennings and Brewer's electrical apparatus for indicating the level of water or other fluids in reservoirs, sewers, &c.,‡ and a new arrangement of automatic flushing latrine. This patent latrine is emptied and flushed by an ingenious arrangement of induced siphon action at the outlet, which is maintained until the whole contents of the range of pans are completely discharged. The necessary after-flush then enters, and re-fills the pans. The visitors also inspected the brass-finishing and engineering shops, the marble and slate-working departments, the brass-foundry, &c.; and, altogether, the visit was very instructive and interesting. Thanks were tendered to the Messrs. Jennings,—Mr. Ellice-Clark, the President, Mr. James Lemon (Southampton), and Mr. J. Gordon (Leicester), making some remarks appropriate to the occasion. Mr. Sidney Jennings spoke in reply.

The works of the Lucigen Light Company were next visited. This light, as Mr. Ellice-Clark explained, is not exactly a new idea, but it is the practical outcome of earlier inventions. The light, it may be first mentioned, is produced by burning creosote oil, tar oil, crude petroleum, or other heavy hydrocarbons, blown in the form of spray by compressed air or steam to the burner. It is claimed that by the use of this invention a light equal to 2,500 candle-power, actual, can be obtained for from 2d. to 3d. per hour, while the cost of the plant is put at only one-fourth of that required for electric lighting. The "Lucigen" light can be used in various forms, portable and otherwise, and with vertical or horizontal flames, as the nature of the work may render necessary. It appears to be admirably adapted and has been already largely used for outdoor work—notably by the contractors for the Forth Bridge, the Barking Outfall new sewage works, &c. It is also coming into extensive use in iron foundries and large engineering and other shops, quarries, docks, and railway-yards. While the light is not so glaring as that of the electric arc-lamp, it is more distributive or diffusive in quality, and does not cast such black shadows as accompany the use of the electric arc-light. It is claimed that the "Lucigen" light gives off neither smoke nor smell, but it certainly (as seen at the Westminster works) throws out great heat, and is rather noisy. In the open-air, or in very large covered areas, these would not be very serious objections, and the light has undoubtedly a prosperous future before it, especially in view of its economy of cost and its portability. As Mr. Ellice-Clark remarked, it is "not exactly" adapted for purposes of domestic lighting, but experiments and trials are being made with an improved "Lucigen" of much smaller size and lighting power than those hitherto made and used, and it is hoped and believed by the Company that this form of "Lucigen" light will be able to successfully and safely compete with gas or electricity for the lighting of the public streets.

Subsequently a visit was paid to Brin's Oxygen Works at Westminster, a full description of which will be found in *Industries* for October 21, 1887. The following particulars are taken from that journal:—Considerable interest, said our contemporary, has been aroused lately in scientific and industrial circles by a report that separation of the oxygen and nitrogen of the air was being effected on a large scale in London by a process which promises to render the gases available for general application in the arts. The cheap manufacture of the compounds of nitrogen from the gas itself is still a dream of chemical enthusiasts; and though the pure gas is now available, the methods of making its compounds have yet to be devised. But the industrial processes which already depend directly or indirectly on the chemical union of bodies with atmospheric oxygen are innumerable. In all these processes the action of the gas is impeded by the bulky presence of its fellow constituent of air, nitrogen. We may say, for instance, in homely phrase, that whenever a fire burns there are four volumes of nitrogen tending to extinguish it for every volume of oxygen supporting its combustion; and to the same degree the nitrogen interferes with all other processes of atmospheric oxidation, of which most metallurgical operations may be given as instances. If, then, it has become possible to remove this diluent gas simply and cheaply, in order to give the oxygen free play in its various applications, we are doubtless on the eve of a revolution among some of the most extensive and familiar of the world's industries. A series of chemical reactions has long been known by means of which oxygen could be separated out of air in the laboratory; and at various times processes based on these reactions have been patented for the production of oxygen on a large scale. Until recently, however, none of these methods gave sufficiently satisfactory results. The simplest and perhaps the best of them was based on the fact first noticed by Boussingault, that when baryta (BaO) is heated to low redness in a current of air, it takes up oxygen and becomes barium dioxide (BaO^2), and that this dioxide at a higher temperature is re-converted into free oxygen and baryta, the latter being ready for use again. For many years it was assumed, however, by chemists that this ideally simple reaction was inapplicable on a commercial scale, owing to the gradual loss of power to absorb oxygen which was always found to take place in the baryta after a certain number of operations. About eight years ago Messrs. A. & L. Brin, who had studied chemistry under Boussingault, undertook experiments with the view of determining why the baryta lost its power of absorbing oxygen. They found that it was owing to molecular and physical changes caused in it by impurities in the air used, and by the high temperature employed for decomposing the dioxide. They discovered that by heating the dioxide in a partial vacuum the temperature necessary to drive off its oxygen was much reduced. They also found that by supplying the air to the baryta under a moderate pressure, its absorption of oxygen was greatly assisted. Under these conditions, and by carefully purifying the air before use, they found that it became possible to use the baryta an indefinite number of times. Thus the process became practically, as it was theoretically, continuous. After securing patent protection for their process, Messrs. Brin erected a small producer in Paris, and successfully worked it for nearly three years without finding a renewal of the original charge of baryta once necessary. This producer was exhibited at the Inventions Exhibition in London in 1885. Subsequently an English company was formed, and in the autumn of last year Brin's Oxygen Company began operations in Horseferry-road, Westminster, where a large and complete demonstration plant was erected, and the work commenced of developing the production and application of oxygen in the industrial world . . . . We may indicate a few other of the numerous possible applications of cheap oxygen which might be realised in the near future. The greatest illuminating effect from a given bulk of gas is obtained by mixing it with the requisite

* See *Builder*, p. 41, *ante*.

† Described and illustrated in the *Builder* for Jan. 7 last, p. 13.

‡ Described and illustrated in the *Builder* for Sept. 17, 1887, p. 410.

proportion of oxygen, and holding in the flame of the burning mixture a piece of some solid infusible and non-volatile substance, such as lime. This becomes heated to whiteness, and emits an intense light, known as the "Drummond Light," used already for special purposes of illumination. By supplying oxygen in pipes laid by the side of the ordinary gas-mains, it would be possible to fix small Drummond lights in place of the gas-burners now used in houses; this would greatly reduce the consumption of gas and increase the light obtained, or even render possible the employment of cheap non-illuminating combustible gases other than coal-gas for the purpose. Two obstacles at present lie in the way of this consummation,—the cost of the oxygen, and the want of a convenient and completely refractory material to take the place of the lime. Again, the intense heat which the combustion of carbon in cheap oxygen will place at the disposal of the metallurgist cannot fail to play an important part in his operations. There are many processes, too, of metal refining which ought to be facilitated by the use of the gas. Then the production of pure metallic oxides for the manufacture of paints, the bleaching of oils and fats, the reduction of refractory ores of the precious metals on a large scale, the conversion of iron into steel, and numberless other processes familiar to the specialists whose walk is in the byways of applied chemistry, should all profit by the employment of this energetic agent.

Old Battersea Bridge had long been thoroughly out of date, and even unsafe for vehicular traffic, when in 1881 the Metropolitan Board of Works obtained power to erect a new bridge, In due course a contract was entered into with Messrs. Williams, Son, & Wallington, in May, 1886, who undertook to build the new bridge for 143,000*l*. Sanction was obtained for the erection of a temporary foot-bridge, and a contract for this and for the demolition of the old wooden bridge was let to Messrs. Mowlem & Co., in 1885, for the sum of 7,153*l*. The temporary bridge was completed, and the traffic diverted in November, 1885, when the demolition of the old structure was commenced. The work of demolition was completed in April, 1886. The new bridge will span the river in five segmental arches, which will consist of cast-iron ribs resting upon piers of granite. The centre arch will have a span of 163 ft., with a rise of 18 ft., and a headway above Trinity high-water mark of 20 ft. The abutment arches will have a span of 113 ft. 6 in., with a rise of 8 ft. 6 in., and a headway above high water of 10 ft. 6 in., and the intermediate arches will have a span of 140 ft., with a rise of 13 ft. 1½ in., and a headway above high water of 15 ft. 1½ in. The width of the new bridge between the parapets will be 40 ft., divided into a carriageway of 24 ft., and two footways each 8 ft. in width. The carriageway will be supported by seven cast-iron ribs, but the greater portion of the footway will be carried by cantilevers, which will be covered below by a cast-iron coving. The parapet will be an open one of cast-iron. There will be side approaches also from the Chelsea Embankment and from Cheyne-walk, the level of which, says the *Metropolitan* (to which journal we are indebted for these particulars), will also have to be raised, and Cheyne-walk will at the same time be widened to 50 ft. The gradients of all these approaches will be 1 in 30, and the gradients over the bridge will also vary from 1 in 30 to 1 in 31½. On the Surrey side the gradient of the raised approach in the line of Battersea-bridge-road will be 1 in 30. It is proposed to widen this road as far as Park-road to 60 ft. The whole of the works have been designed by Sir Joseph Bazalgette, the Board's Engineer, and are being carried out under his superintendence and that of Mr. Edward Bazalgette, one of the Board's assistant engineers.

The works of the Greenwich Ferry, now in course of construction, were visited by the members on the way down to Barking by steamboat to see the sewage outfall works. We take the following particulars as to the ferry from our contemporary, *Engineering*, for February 17 last:—The working plant at this ferry will consist of two steamboats 120 ft. long, 40 ft. beam, and 6 ft. draught; two landing stages 70 ft. long and 60 ft. wide, and four travelling platforms 60 ft. long and 23 ft. wide, together with the necessary engines, winding gear, &c. The steamboats are shaped like a spoon at each end, and are to be worked to and fro without turning; the landing stages are rectangular, as also are the travelling platforms. Great difficulties have had to be overcome in gaining access from the ferry-boat to the roadway, and *vice versâ*, at all times where, as in this case, the river bottom slopes gradually, and the tide rises and falls 20 ft. The principle for making the connexion is as follows:—With the rise and fall of the tide the distance within which the ferry-boats can approach the bank varies to such an extent that a moveable landing-stage has been designed to always remain with the same deck level above water. This stage, together with two travelling platforms, is moved up and down an inclined way, 348 ft. long, sloping riverwards at a gradient of 1 in 10. The inclined way is made of a bed of concrete 50 ft. wide and a minimum of 3 ft. deep, with footings on each side sloping 1 to 1 to a depth of 5 ft. below the river bed. Four lines of rails run longitudinally down the way, with a gauge of 4 ft. 8½ in. and 11 ft. 3 in. centres; the rails are of bridge section, 72 lb. to the yard, bolted to 6 in. by 6 in. wrought-iron transverse sleepers, 30 lb. to the foot, which are in turn bolted to wrought-iron longitudinals 8 in. by 6 in., weighing 33 lb. to the foot. Both transverse and longitudinal sleepers are bedded in the concrete, the rails alone appearing above its surface. The work of laying this road-bed and rails was done at low water, the under-water work being put in with skips from barges moored in the river. As the tide falls, the landing stage will be lowered down the incline, and the travelling platforms will work up and down to convey traffic from the banks. The road approaches on each side are 53 ft. wide, ending in an abutment wall, varying in thickness from 3 ft. at the top to 6 ft. on the footings; the road approaches are 5 ft. 6 in. above Trinity high-water mark. On each side of the river, just behind the abutment walls, two cast-iron cylinders are sunk close to each other to a depth of 145 ft. below the level of the roadway. The cylinders are 10 ft. in diameter on top, increasing in size by varying cones to 11 ft. 6 in. in diameter at the bottom; the metal varies in thickness from ⅞ in. to 1⅜ in. The cylinders are for the purpose of wells, in which weights will be worked to act as counterpoises to the travelling carriages and landing-stage; sufficient engine power has been provided to overcome the inertia in moving these platforms, and also any additional weight of traffic which they may carry. As the slope on which they travel is 1 in 10, one-tenth of the weight in the wells will balance that of the platforms and landing-stage. The travelling platforms are four in number, two on each side of the river, rectangular in shape; length, 60 ft.; breadth, 23 ft. 2 in. over all; 21 ft. clear width of roadway between kerbs; depth of steel body, 2 ft. 7 in.; depth over all to top of wood paving, 3 ft. 9 in.; total weight unloaded (each), 125 tons. They are built of mild steel throughout, all vertical plating being ⅜ in. in thickness; top and bottom skin, ¼ in.; there are four internal longitudinal girders and eleven transverse. Two of the longitudinal and four of the transverse girders form water-tight bulkheads, making a total of fifteen separate water-tight compartments in each. The longitudinal girders are of a ⅜ in. web, flanges composed of two angles, 4 in. by 4 in. by ⅜ in., and a plate of 8 in. by ½ in. Transverse girders ⅜ in. web; flange, one angle, 4 in. by 4 in. by ⅜ in., and a plate of 1 in. by ½ in.; this latter forms the butt covers for skin plating. The rivets throughout are ¾ in. in diameter, and 2½ in. pitch. The decks are of 12 in. by 8 in. creosoted Memel timbers, laid on the flat, running transversely, and covered with 6 in. creosoted Memel block-paving. Four lines of tram-rails, 72 lb. to the yard, are laid the whole length of the carriage, flush with the top of the wood paving. Longitudinal guard timbers or kerbs 14 in. by 8 in. are provided on each side, and protected with steel angles 4 in. by 4 in. by ⅜ in. Galvanised handrails 1¼ in. in diameter run on each side the whole length, supported by stanchions 5 ft. apart. Each travelling carriage is carried on twenty-four steel wheels 18 in. in diameter fixed under bogies, and so arranged on pivots that the weight is evenly distributed on each. In case of a carriage getting off the rails, it would float itself, together with an additional weight of fifty tons of traffic. The landing-stages are two in number, one on each side of the river. They are rectangular in shape, 70 ft. 2 in. long, 50 ft. wide; depth of steel body, 6 ft. 6 in.; depth over all from surface of roadway, 7 ft. 8 in.; total weight (each) unloaded, 270 tons. The details of construction are similar to that of the travelling platforms, saving that they are constructed in two distinct parts, and subsequently bolted together, also that the tram-rails run transversely instead of longitudinally, while on the decks at either end are shelters and the usual offices; bollards are also fixed on the river side of the stage for the secure mooring of the ferry-boats. The stages are carried on thirty-two steel wheels, similarly pivoted to those of the travelling platforms. It is proposed to light the road approaches, platforms, stages, and ferry-boats with electric light. The hauling power provided at each side of the river, to work the platforms and stages, consists of two treble-geared, double-cylinder, high-pressure winding-engines, with cylinders 14 in. in diameter and 18-in. stroke, the winding-drums are 5 ft. in diameter; all winding ropes are of steel wire 1½ in. in diameter. The ferry has been so designed that should the necessity at any time arise to transport railway traffic and rolling-stock from the Great Eastern Railway on the one side to the South-Eastern on the other, it can be done by the present plant, and with this object in view the approaches, platforms, stages, and boats have been constructed. The designs for the plant and arrangement of approaches have been made by Messrs. Standfield & Clark, of 6, Westminster-chambers, who are engineers to the company. The contractors are Messrs. Appleby Bros., Limited, of East Greenwich.

Altogether, the round of visits was very interesting and instructive.

PUSH AND PULL LOCKS.

KAYE AND OTHERS *v.* CHUBB AND SON'S SAFE AND LOCK COMPANY (LIMITED).

THIS was an appeal (heard in the House of Lords, before the Lord Chancellor, Lord Watson, Lord Fitzgerald, and Lord Macnaghten) from a decision of the Court of Appeal reversing a judgment of the Queen's Bench Division in an action brought by the appellants against the respondents for the alleged infringement of a patent apparatus for fastening and unfastening doors, gates, lids, and windows.

Sir H. Davey, Q.C., Mr. Aston, Q.C., and Mr. Macrory appeared for the appellants; and the Attorney-General and Mr. Bunting for the respondents.

The appellants' and the respondents' door-latches are all made on what is known as the "push and pull" principle—that is to say, the latch is withdrawn from the doorpost, not by turning the door-handle round, but by pulling the inside handle or pushing the outside one. At the trial in November, 1886, Mr. Justice Mathew gave judgment for the appellants; but his decision was reversed by the Court of Appeal, who ordered judgment to be entered for the respondents. At the hearing of the appeal judgment was postponed.

Their Lordships now gave judgment, being of opinion that the appellants' invention was valid.

Judgment reversed, with costs.—*Times*.

SEVILLE CATHEDRAL.

SIR,—Some few days back it was reported in the *Morning Post* that one of the piers of the nave of Seville Cathedral had given way and fallen, bringing down a part of "the roof," and crushing the organ underneath. Such a catastrophe is a subject of the greatest possible interest, not only to architects and artists, but to the world in general, and it is to be hoped we shall hear that measures have been taken to secure the other parts of the structure, weakened as they must be by the fall of the arch and groining over it.

When at Seville in 1882 I noticed that very extensive works of reparation were going on in the north transept and in the bays of the "Capella Mayor" next to the "Crucero." At Seville there is no *roof* (as *we* use the word), for the groining itself is the only covering, and is paved at the back, so that the water finds its way down into the "pockets," and thence is discharged by pipes; but I was told that there had been extensive leakages, and that the reparations were made necessary by some failures due to this cause.

It is to be feared that the fall of the pier may be due to the soakage of wet, or it may be on account of some defect in its building, though in the fourteenth century such work was better done than in Norman times.

The organs are under opposite arches of the "coro," which, as is usual in Spanish churches, occupies the eastern bays of the nave. It is therefore to be feared that the splendid stall-work must also have suffered. It is to be hoped that the account given is exaggerated, and that the

harm done is comparatively easy of repair. But, when one remembers the magnificent effect of the interior, due partly to the rich brown tone of age, reminding one of the somewhat similar tone of Westminster, it is grievous to think of the necessary patchwork effect of a quantity of new masonry.

R. Herbert Carpenter.

Aug. 7, 1888.

DOWN DRAUGHT IN DWELLING-HOUSE CHIMNEY.

Sir, — Respecting the inquiry of "Boreas" [*Builder*, p. 89, *ante*], I venture to suggest the advisability of ascertaining if there is in the chimney, just over the register of the stove, a large open space or pocket; if so, the bricking-up of it will, in all probability, lessen the noise; and the registers may shut, but yet not fit, *i.e.*, close off tightly. I do not advise cowls or wind-guards in such a case, but a cone at the top of chimney, such as a funnel turned upside down on to it, and cut off at a spot where the diameter of the cone of the funnel is the same as the chimney, and then raised and supported on stays so that the bottom edge of the funnel ring is just below the top of the chimney.

A similar means of closing the top could be made as that used to close pottery and such kilns, but this is not at all sightly on a dwelling-house.

F. Botting.

ST. CLEMENT'S WELL.

Sir,—Adverting to your "Note" [p. 78, *ante*] relating to the vacant ground adjoining the new Law Courts, I am informed that some remains of the old St. Clement's well were found on the digging up of the vacant ground. I was told that the well was discovered at a distance of, say, 30 yards, west, from the engine-house door. It was speedily obliterated; nor, so far as I know, was any record made of its situation.

Since the ground is about to be laid out,—by private munificence,—for public benefit, the well may possibly be again uncovered. In that event it is to be hoped that some mark will be set up to indicate the precise position of a spring whose sweet, clear water was once so venerated, and is commemorated by

Fitzstephen.

August 7, 1888.

The Student's Column.

ARTIFICIAL STONES.—VI.

Stones formed from Plaster of Paris (continued).

In Jacobsen's patent the plaster is treated with a hot saponaceous solution made by adding to ten times their weight of hot water a mixture of stearic acid and soda lye.

A large number of stone-like products are obtainable by the admixture of the salts or other hardening or binding materials with the plaster before casting. Such stones are in some cases weather-proof, more ornamental, and much harder than ordinary plaster casts.

Brethauer's weather-proof plaster casts are made by mixing a little lime with the gypsum, and making up the mixture with lime-water; when the cast is dry it is painted with hot linseed oil. Although the matter does not strictly belong to this section of our subject, it may be useful to point out that the converse of Brethauer's mixture forms Colonel Scott's well-known "selenitic mortar," in which the water used for mixing with the lime, &c., is previously stirred up with a little plaster of Paris, or, less preferably, sulphate of iron, the resulting mortar becoming much harder than is ordinarily the case.

Evaux's artificial marble is directed to be formed from plaster of Paris treated with albumen and suitable mineral colours, the ground being zinc white. Rowbotham and Richardson also employed plaster of Paris and albumen in the production of their artificial stone; the albumen was mixed with the plaster, and coagulated by heat or chemical agency, such as washing over with or soaking in a solution of tannic acid. The product was a substance capable of taking a high polish, and resembling white marble. The addition of suitable pigments permits of the manufacture of effective coloured imitations.

Lilienthal utilised for his artificial stone Keene's cement, which is a mixture of alum and plaster of Paris. This is added to slaked lime and curdled milk. The composition dries and hardens well if left undisturbed.

Stucco made with plaster of Paris and a solution of gelatine forms a firm coating which polishes well, and can be treated so as to resemble marbles of different kinds. Scagliola, which is formed from such a stucco, is one of the oldest of the mixtures employed to imitate ornamental marbles. The substance has long been used in Italy, but is believed to have been first used in this country by James Wyatt in the latter half of the last century, it being employed by him in the decoration of the columns of the Pantheon in Oxford-street. The successful imitation of marble, of course, depends on the skill and taste of the artist, but the following is a brief sketch of the operations involved. The stucco is formed of carefully-calcined and well-powdered pure gypsum, mixed to a suitable consistency with solutions of best glue or isinglass, and the necessary dyes or pigments are also added at this stage, if a coloured marble is desired. For the veinings, streaks, &c., the different colours are carefully arranged and laid on, the veins being, as it is technically termed, "floated in." When set, the surface is rubbed down with pumice and cleaned with a wet sponge, polished with Tripoli earth and pure charcoal first, then with Tripoli and oil, and lastly with oil only.

An artificial stone called "lithomarlite" is obtained by adding to a sufficient quantity of plaster of Paris three gallons of water, half a pint of glue water, and three ounces and a half of powdered borax.

In "Keating's" and "Parian" cement we also find borax mixed with plaster of Paris, which enables a more ornamental and marble-like surface to be produced.

Other artificial stones in which plaster of Paris is the leading constituent are the following: — Lincolne and Chafer's stone, in which either Keene's cement or ordinary plaster of Paris is suitably coloured, and then thrown forcibly on to polished surfaces or pressed into moulds having smooth internal surfaces of glass or metal so as to produce a bright smooth cast free from air bubbles.

Books.

Lessons in Decorative Design: an Elementary Text-book of Principles and Practice. By F. G. Jackson, Second Master in the Birmingham Municipal School of Art. London: Chapman & Hall, 1888.

The author of this small book, which is put forth as an inexpensive text-book of the study of the principles of decorative design, quite understands the philosophy of his subject. He upholds the view, now recognised as truth by all thoughtful artists in and students of decorative art, that such art "rests on adaptation, and there cannot be true ornament unless we employ art in adapting our details to the object to be decorated." But in conjunction with this he adds a piece of advice, the truth and importance of which is in danger of being forgotten, that in the pursuit of the power of decorative design, "the power to render natural forms pictorially should not be neglected, but, on the contrary, should be cultivated to the highest point." This is perfectly true. No one who cannot draw a flower with truth and beauty of natural representation is likely to be able to apply it in a conventional form with artistic truth and beauty. For it is part of the very process of conventionalising ornament that the essential and most characteristic parts of the original model should be laid hold of and emphasised, and it is only the careful student and delineator of the natural form who can enter so thoroughly into its character and essential point of design as to lay hold of and translate these into ornament. We sometimes meet with teaching and practice in ornamental design which would lead one to the supposition that the employment of natural forms in ornament really consisted in a kind of dissection of a flower, and a reduction of its parts to a collocation of forms geometrically arranged. That kind of work, however, is often rather contrivance than design in the proper sense.

On plate xiv., and in the remarks in connexion therewith, we observe that the author suggests an idea as to the origin of the "Acanthus" leaf in Greek ornament, which we have not noticed before; he suggests it as a development out of the radiating brush form, commonly called the honeysuckle ornament, by grouping the brush-marks together in threes, leaving a little space between each group, which becomes the rib of the leaf. Thus, he says, "the result is the creation of an ornamental leaf which, while it has no exact prototype in Nature, yet possesses natural qualities, and is more truly decorative than a natural leaf can be, because it has been developed out of certain constructive necessities and in perfect harmony with natural laws." We are disposed to think that the Greek acanthus leaf is more of a direct adaptation from Nature than this, but the idea is ingenious, and may suggest some new treatments in decorative leaf-design.

The only defect of the book is that the illustrations are, for the most part, not very well or finely drawn, nor very attractive in themselves, which is to be regretted in a book on ornament, considering that ornament is attractive or nothing. As diagrams to illustrate the remarks, no doubt they fulfil their object well enough; but they do not do much to train the pupil's eye in the right way. This is the only criticism we have to make. In regard to general theoretic teaching the book is a sound and rational guide, and may be recommended as such.

Building Estates: a rudimentary treatise on the development, sale, purchase, and general management of building land, including the formation of streets and sewers, and the requirements of Sanitary Authorities. By Fowler Maitland, land and engineering surveyor. Second edition, revised. London: Crosby Lockwood & Co., 1887.

Considering that the book with this title consists of only 112 pages 12mo, it will be readily perceived that it must be distinctly "rudimentary." It would be useful for giving general readers an idea of the nature of the transactions involved in obtaining and managing anestate, and all knowledge of affairs may have its interest and value; and it may serve to suggest to an intending purchaser of an estate the nature of the enterprise he has embarked on, and the points he will have to take thought for in the course of it. But the book will not enable anyone to become his own land or building surveyor, or his own conveyancer; nor, perhaps, is it intended that it should. The preface, however, seems to imply that it was intended as a possible guide-book "to some who, without previous experience, find themselves engaged on work of this nature." The second part contains general information as to the jurisdiction and regulations of sanitary authorities, which may be useful to many people, and brief advice about the laying-out of sites for building and the operations of surveying. These are all good as far as they go, but their chief use will be in enabling general readers to gain some little knowledge about a department of work the general principles of which, at least, any one may find it some day or other desirable to know something of.

Architects' Joinery and its Ornaments. By F. A. Fawkes. London: B. T. Batsford. 1888.

This is in reality a pattern-book of mouldings and ornaments kept in stock, designed in the now-prevalent free Classic style. They are good of their kind, though we do not see the particular value of them to architects, who, if they really care for the interior finish of their buildings, usually prefer to design their own mouldings.

The Great Eastern Railway Company's Tourist Guide to the Continent. Edited by Percy Lindley. Illustrated. New edition. Published for the G.E. Railway Company.

This is a well-written guide to that part of the Continent, viz., Holland and Belgium, to which the Great Eastern Railway, viâ Harwich, affords the shortest route. The guide also includes the Bernese Oberland. It contains a good deal of information about the places named, accompanied by a number of small views of landscape and buildings, which perhaps are rather intended to attract the tourist beforehand than to serve as records after the visit, but they form an ornamental addition to the interest of the volume, which is conveniently small in size.

The Swedish Granite Industry.—We referred recently to the flourishing state of the Swedish granite industry, and we now learn that a Swedish quarry has received the order for all the granite and sandstone required for the new Town Hall in Hamburg, valued at £25,000. Moreover, the other day an order for 500 hewn grave monuments of various kinds of granite for Germany was executed by a firm in Varberg.

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

10,950, Apparatus for Closing Doors. J. H. Bean and W. Gaines.

This invention refers to an improvement on or addition to a former specification, whereby an ordinary metallic cylinder is employed with a piston-rod working therein. In order to ensure greater steadiness, at the outer end of the piston-rod is mounted a pulley engaged within a link or slotted arm and hinged to a bracket on the casement and door-frame. When the door is opened a radial movement is imparted to the link or slotted arm by the rod attached to the door-frame. The pulley being engaged with the link or slotted arm rolls therein, causing the piston to be withdrawn from the cylinder, and the spring therein to be compressed. When the door is released the spring operates upon the piston through the medium of the pulley, bringing back the link to its original position and closing the door.

11,103, Fixing Wood Linings to Walls and Ceilings. F. W. Jones.

According to this invention an iron web is used of I shape, with holes drilled in the longest flange, and tapped for screws. One end is built in the wall, the other flange end projects out, and to this skirting-boards, framing, door-jambs, &c., may be fastened.

11,961, Door-Springs. B. Turner.

This invention consists in the combination with the spring which acts upon the door of a check cylinder, of a fitted piston, by means of which the slamming of the door as it closes is entirely prevented. The combination with a door-spindle acted on by a spring or an arm secured thereto, and forming the rod of a piston caused to reciprocate in a cylinder as the door opens and closes is the chief claim of the invention.

12,014, Automatic Appliance for Closing Doors. G. Brewer.

The appliance which is the subject of this invention consists of a standard or bracket having a forked end thereto, in which a pulley is mounted to carry or receive a caoutchouc or other cord. The two ends of the cord are made into a ring held by pins or studs, one of which is secured to the door-frame, the other to the door, forming an angle the summit of which is on a pulley affixed and the base on the door and frame; the caoutchouc contracting closes the door.

12,239, Hand-Saws. R. M. Johnson and T. H. Benton.

This invention has for its object the use of one handle with any number of blades, the parts being so constructed that they may be separated and secured together again with the greatest ease and rapidity. The butt end of the blade is made with a projecting rib or ribs on each side of the blade. A nearly half-round strip of metal is rivetted or otherwise secured to the blade, so that with the intermediate thickness of the blade the cross section would be a circle. At the end of the sawgate made in the handle to receive the blade a hole is bored, corresponding with the ribbed end of the blade, and so that the butt end of the blade may be slotted into it.

NEW APPLICATIONS FOR PATENTS.

July 27.—10,876, W. Hardcastle, Attaching Lines, Cords, or Chains to Window-sashes, Shutters, &c.—10,882, E. and E. Kerry, Jointing Drain-pipes, &c.

July 28.—10,908, W. Cains, Drain-pipe.—10,913, G. Davis, Drain Traps.—10,922, J. De Jong, Tip Wagons.—10,955, H. Schou, Door Stops and Closers.—10,960, E. Newton, Surveying and Levelling Instruments.

July 30.—10,966, G. Woolliscroft, Decorating Tiles, &c.—10,973, C. Armstrong and J. Robinson, Safety Hydrostatic Blasting Tube for Blasting Stone, &c.—10,979, T. Thorp, Water Meter and Waste Preventer.—10,990, C. Shewbrooks, Roofing Tiles.—11,019, W. Moseley, Electric Bells.—11,027, R. Petrie, Draw and Push Bolts for Doors, Windows, &c.

July 31.—11,089, G. Long, Fence and other Posts.

Aug. 1.—11,148, T. Douse, Checking or Subduing Fire in Buildings, &c.

Aug. 2.—11,176, J. Bass, Signs, Sign-writing, and Street Directions.—11,198, E. Brooke, Burning White or Coloured Glazed Bricks, &c.—11,199, J. Ferguson, Finger Plates.—11,202, C. Schubert, Band-saw Machinery.—11,211, A. Falkner, Locks and Keys.

PROVISIONAL SPECIFICATIONS ACCEPTED.

11,237, H. Noble and G. Haley, Hearths of Fireplaces, Fenders, and Dadoes of Metal and Enamel.—5,808, A. Ponton and Others, Artificial Marble, Granite, and Other Stone.—8,630, P. Clark, Kitchen Ranges.—9,080, T. Robb, Parquetry Flooring, &c.—9,442, M. Lansdell, Set Squares, T Squares, &c.—9,751, F. Smith, Caps or Heads for Ventilating and Flue Shafts.—9,792, W. Stephenson, Door-closing Apparatus and Door Checks.—9,826, I. Kirkbride, Raising or Lowering Window-sashes and holding them in any desired position.—10,005, J. Brown and W. Mackenzie, Nails.—10,072, E. Carpenter, Connecting Pipes.—10,078, A. Boult, Artificial Marble and Serpentine.—10,180, J. Da Fonseca, Water-closets and Urinals.—10,304, A. Menant, Connecting Lengths or Sections of Gutters, &c.—10,332, T. Crapper, Disconnecting Traps for Sanitary Purposes.—10,365, E. Oates, Paint-removing Compound.—10,473, J. Schlesinger, Manufacture of Cement.—10,673, R. Wright, Self-Locking Window-sash Fastener.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

11,966, J. Petter, Stoves and Fireplaces.—12,467, A. Winrow and H. Roetandy, Brickmaking Machines.—12,857, H. Waddington, Ventilator.—13,127, A. Stephenson, Butt Hinge and Method of Fixing same to Doors.—13,258, W. Dutton, Revolving Door-post, or other Posts for Public Buildings, &c.—5,548, R. English, Condensation Gutters, Metal Weatherings, and Door-step Plates.—6,023, J. Trinick, Sash Fasteners.—9,234, J. Cartland, Door Bolts, &c.—9,656, A. Elmendorf and Others, Water-closets.

RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

July 26.

By S. & G. Kingston (at Bourn).

Lincolnshire, Bourn, near — A residence and 77a. 3r. 17p., sold for £5,200
Dock Furrows Farm, and 75a. 0r. 3p. 3,600

July 30.

By Walker & Runtz.

Woodberry Down—The Limes, 33 years, ground-rent £19. 13s. 1,620
Clapton—107 and 109, Elderfield-road, 90 years, ground-rent £5. 5s. 420

By G. A. Wilkinson.

Sydenham—5, West-hill, and 2a. 1r. 26p. freehold 4,300

By Messrs. Cronk.

West Malling, Kent — Springates Hill Farm, 44a. 3r. 12p., freehold 4,200
Birling—An enclosure of land, 6a. 1r. 30p., freehold 300

By J. & R. Kemp & Co.

Kentish Town—53, Lawford-road, 73 years, ground-rent £8. 435

By A. R. Savage & Son.

Mile End—51, St. Peter's-street, 42 years, ground-rent £3. 8s. 315

By Harman Bros.

Beckenham, Clifton-terrace—Ground-rents of £58, term 71 years 1,165
Church-road—Ground-rents of £24, term 71 years 450
South Norwood — Ground-rents of £48, term 73 years 915
Forest Hill—123, Stanstead-road, freehold 305
Beckenham, Mackenzie-road—A plot of freehold land 60
Brondesbury — 11, Winchester-road, 71 years, ground-rent £16. 610
South Acton—21, Osborne-road, freehold 250

July 31.

By Prickett, Venables, & Co.

Lambeth—26, 28, and 30, South Lambeth-road, freehold 1,300

By L. Farmer.

St. John's Wood—28, Alma-square, 64 years, ground-rent £9. 410
Kilburn—53, Princess-road, 74 years, ground-rent £7. 10s. 405
Maida Vale—39, Carlton-road, 60 years, ground-rent £6 490

By G. W. Dixon.

Islington—11, Rochester-terrace, 55 years, ground-rent £6. 420

By A. Richards.

Tottenham—The residence, Piper's Court, and 1¼ a., freehold 1,450
Two freehold cottages 250
High-road—A plot of land, area 2,385 ft., freehold 900
1, Laurel-terrace, 76 years, ground-rent £5. 5s. ... 95

By Reynolds & Eason.

Commercial-road East—16, Harding-street, freehold 310
Victoria Park—1 to 9 odd, Prince Edward-road, 83 years, ground-rent £15 240

By Debenham, Tewson, & Co.

Maidenhead, Castle Hill — Shirley Cottage, and 6a. 2r. 0p., freehold 3,800

By Ventom, Bull, & Cooper.

Newington-butts—26 and 28, Draper-street, freehold 1,660
Streatham—1, 2, and 3, Greyhound-lane, and a plot of land, freehold 760
1, 2, and 3, Church-place, freehold 360
1 to 4, Woodside-cottages, freehold 655
2 and 3, Greyhound-place, and a corner shop, freehold 2,020
High-road—Freehold enclosure of land, 5a. 1r. 19p. 13,550
A plot of freehold land, with buildings thereon. 1,000

By C. & H. White.

Tulse-hill—112, Norwood-road, 91 years, ground-rent £10. 10s. 1,105
Walworth-road—A plot of land, area 1,545 ft., let at £56 a year ..... —
A plot of land, area 642 ft., let at £16 a year ..... —

Aug. 1.

By B. Brown.

Norwood, Belvidere-road—Emsley Lodge, 59 years, ground-rent £18 1,000
Millwall—215 and 217, West Ferry-road, 23 years, ground-rent £5 250

By G. Pearce & Sons.

Islington—84 and 86, Prebend-street, 39 years, ground-rent £8. 8s. 680
Hoxton—41, Baring-street, 45 years, ground-rent £3. 15s. 260
Clapham—42, 44, 46, and 50, Fentiman-road, 37 years, ground-rent £26 1,235

By H. Rutley.

Wallington, Clifton-road—Two plots of freehold land 370

By Fuller, Horsey, Sons, & Cassell.

Rotherhithe—The Horse Public-house, freehold..... 800

By Giddy & Turner.

Netley, Hants—The Hermitage, and 6¼a., leasehold, ground-rent 5s. £1,800

By W. W. Jenkinson.

Henley—A plot of freehold land 135
Stamford Hill—Ground-rent of £25, reversion in 94 years 550

By Green & Son.

Hammersmith — 69 to 75 odd, Bridge-road, copyhold 2,365
62 to 68 even, Bridge-road, copyhold 1,590
Copyhold ground-rents of £26, reversion in 46 years 785
Improved ground-rents of £16. 8s., and the residence called Jamaica Lodge, term 26 years 440
Improved ground-rents of £18. 14s., term 26 years 200

Aug. 2.

By J. Baker & Son.

Walham Green—Eleven plots of freehold land 350
Willesden-lane—Three plots of freehold land 150
Walthamstow—42, 44, and 46, Beulah-road, freehold 650
Stoke Newington—104 and 106, Winston-road, 72 years, ground-rent £11 525

By Searle, Halton, & Co.

Enfield, Chase Side—Four plots of freehold land ... 175

By Harcourt, Mills, & Co.

Epsom, Upper Down's-road—The Rhallt, freehold 1,420

By Izard, Dawe, & Co.

Walthamstow—Greenside and Greenleaf Houses, freehold 625

By Robinson & Fisher.

Marylebone—44, 46, and 50, Church-street, 33 years, ground-rent £31. 10s. 955

By R. J. Collier.

Clapton—23, Heyworth-road, freehold 740
South Hackney—47, Cassland-road, 73 years, ground-rent £6. 6s. 340

By Newson & Harding.

Ilford—13, 14, and 15 (unfinished), Oatlands-avenue, 99 years, ground-rent £11 80
Holloway—40, Davenant-road, 70 years, ground-rent £7 240
Islington—20, Cloudesley-square, 22 years, ground-rent £8. 130

By C. D. Field & Sons.

Bermondsey New-road—A plot of freehold land, area 6,345 ft. 1,260
Four plots of freehold land 2,560
Dockhead—A plot of freehold land, area 3,930 ft.... 450

Aug. 3.

By A. & A. Field.

Mile End—21 and 22, Sidney-square, 12 years, ground-rent £7 315
Spitalfields—24, Wheeler-street, 24 years, ground-rent £30 205
Mile End—30, St. Ann's-road, freehold..... 205

By Mullett, Booker, & Co.

Hyde Park—9, Sussex-mews East, 47 years, ground-rent £15 460

MEETINGS.

Saturday, August 11.

Royal Archæological Institute.—Leamington Congress (continued). Visit to Coventry.

Monday, August 13.

Clerks of Works' Association (Carpenters' Hall).—Paper by Mr. T. Gamage. 8 p.m.

Royal Archæological Institute.—Leamington Congress (continued). Visits to Baddesley Clinton, Knowle, Solihull, Meriden, Berkeswell, and Coventry.

Tuesday, August 14.

Royal Archæological Institute.—Leamington Congress (continued). Visit to Leicester.

Wednesday, August 15.

Royal Archæological Institute.—Leamington Congress (continued). Visit to Melton Mowbray.

Builders' Foremen and Clerks of Works' Institution.—8.30 p.m.

Miscellanea.

Brickmaking and the Recent Rains.—The reports received from the various brick-fields in Kent and other surrounding districts for some weeks past show that the continued wet weather is having a very serious effect upon the manufacture. Some of the fields have been almost stopped, while all have lost considerable time, and consequently have made many less bricks than they are accustomed to. The result will be that stock bricks and other qualities of that class will be very scarce, and there is every prospect of the price, which has for three or four years been abnormally low, being advanced considerably. The heavy rains and disastrous floods of last week caused great havoc in some districts, particularly in Essex, whence it is reported that some hundreds of thousands of bricks that had been partially dried in the hacks have been washed down, thus still further reducing the previously small quantities made.

Society of Arts.—The Society offer prizes to art-workmen for the session 1888–89, in pottery, stone-carving, wrought iron work, and goldsmiths' and silversmiths' work. All articles for competition must be sent in to the Society's house on or before Tuesday, April 23rd, 1889. Further particulars can be obtained from the Secretary of the Society of Arts, John-street, Adelphi.

The Tower Bridge.—The following is a description of the new bridge which is rising east of the City, under the direction of the Corporation, and a comparison of it with London Bridge:—Total length of bridge, 940 ft.; total length of bridge and approaches, 2,640 ft.; opening span, width, 200 ft.; opening span, headway, when opened, 135 ft.; opening span, headway, when shut, 29 ft. 6 in.; side spans, width, 270 ft.; side spans, headway, from 20 ft. to 27 ft.; width between parapets, opening span, 50 ft.; width between parapets, side spans and approaches, 60 ft.; steepest gradient of approaches, 1 in 40 (steepest gradient of approaches of London Bridge, 1 in 7); depth of foundations, 60 ft. below Trinity high water mark, 27 ft. below bed of river; sectional area of waterway, 20,040 square feet (London Bridge, 19,300 square feet); depth of water in opening span at high water, 33 ft. 6 in.; depth of water in opening span at low water, 13 ft. 6 in. Estimated quantities of materials in the bridge and approaches:— Bricks, 31,000,000; concrete, 70,500 cubic yards; cement, 19,500 tons; granite and other stone, 235,000 cubic feet; iron and steel, 10,500 tons. Machinery, &c.:—Two steam pumping engines for hydraulic machinery, each 360-horse power; eight large hydraulic engines and six accumulators, four hydraulic lifts in towers for passengers; size of each leaf of opening span, 50 ft. wide by 100 ft. long; weight of each leaf of opening span, including roadway and counterbalance weights, 700 tons; estimated cost, 750,000*l.*—*City Press.*

The Birkbeck Building Society.—The thirty-seventh annual meeting of the Birkbeck Building Society was held on the 26th ult. at the offices, 29 and 30, Southampton-buildings, Chancery-lane. The report, adopted unanimously by the meeting, deals with big figures, for it states that the receipts during the year ending 31st March last amounted to 9,394,559*l.*, making a total from the commencement of the Society of upwards of one hundred millions sterling (109,698,081*l.*). The deposits during the past year were 7,170,342*l.*, and the subscriptions 182,989*l.*, while the gross profits amounted to 177,155*l.* It is stated that the surplus funds have been augmented to the extent of 377,255*l.*, and are now upwards of four millions (4,051,899*l.*), nearly two millions (1,830,133*l.*) being invested in British Government and Indian and Colonial Securities. In addition, there is a balance in the hands of the bankers of 341,846*l.* The balance profit in excess of liabilities is 222,214*l.* The twelfth triennial bonus (amounting to 23,713*l.*) has been allotted to the shareholders during the year, in addition to which 15,000*l.* have been added to the permanent Guarantee Fund, which is now stated to stand at 125,000*l.*, the whole being invested in Consols. The subscriptions and deposits withdrawable on demand amount to 4,374,469*l.* There are 49,763 shareholders and depositors.

The Proposed New Tooting Railway.—The proposal (to which we recently referred) for constructing a line of railway from High-street, Tooting, to the Wimbledon and West End section of the London and South-Western line, and also from Tooting to the London and Brighton line at Streatham, is being actively agitated, a large and influential committee having now been formed in support of the undertaking. Last week a numerously-attended meeting of the inhabitants of Summers Town, through which the proposed line will pass, and where there will be a station, was held in the parish school-room, when a very strong feeling was expressed in favour of the proposed line being carried out. Mr. Grover, C.E., the engineer who has designed the line, explained the course which it was proposed it should take. He observed that at present, as regarded railway communication, they might almost as well be in China; but should the proposed railway be carried out, Tooting would be placed in direct communication with the City on the one hand, and with the West End on the other hand. He said that one great thing in their favour was that the line—about three miles in length—could be made very cheaply, as it would pass through a district where there were very few houses, and consequently there would not be any large amount of compensation to be paid, whilst the line itself could be made at an unusually small cost. It was stated at the meeting that neither the London and Brighton nor the London and South-Western Company intend to offer any opposition to the line.

The English Iron Trade.—Although there has been a slight relapse in the pig-iron trade, the English iron market, on the whole, remains firm, with a good business doing. The partial check in pig metal can only be considered temporary, as the shipments still keep up well, and the home consumption is satisfactory. Prices of Scotch pig-iron warrants have fluctuated round 39s. cash, whilst Scotch makers' iron has changed but little. At the beginning of the week, North of England pig was about 3d. per ton lower, but it has since recovered. Lancashire iron is well maintained. Hematite pig is nominally held at 43s. 6d., but little business has been at full rates. Manufactured iron is firm in tone, there being a steady and even brisk demand. Tin-plates show a rising tendency, and makers report good orders. The steel trade is in a fairly prosperous condition, full activity being maintained at works. The demand for shipbuilding material is especially well sustained, shipbuilders being fairly busy. Engineers continue well employed. —*Iron.*

The "Alexander Thomson" Memorial.—At a meeting of the trustees, held in the Religious Institution Rooms, Glasgow, on the 1st inst., Mr. David Thomson, President of the Glasgow Institute of Architects, in the chair, Mr. William James Anderson, who gained the architectural travelling studentship in December last, submitted the sketches which he had made during his tour in Italy, together with a descriptive memoir in manuscript. The sketches, sixty-four in number, with nine sheets of measured drawings, were exhibited on the walls, and carefully examined by the trustees, who expressed themselves extremely gratified with the work, as evidence of Mr. Anderson's diligence and industry while on his tour, as well as of his skill and ability. In the National Competition at South Kensington the silver medal has just been awarded for the drawings of the prizeman, and the competitive drawings of two of the other candidates for the Alexander Thomson Studentship have also gained prizes at South Kensington.

The Registration of Plumbers.—At the City and Guilds Institute, Finsbury, on Saturday afternoon, an examination was held, under the auspices of the Plumbers' Company, for certificates of registration. The practical examination included various branches of lead-work and the theoretical questions relating to the subjects of plumbers' materials, house-fittings, and sanitation. Plumbers attended from several districts of Middlesex, Surrey, and Yorkshire. The examiners were Mr. Chas. Hudson (assistant-chairman of the registration committee), and Messrs. Clarke, Gilbert, Nurse, Webb, and Millis. Seventy-five per cent. of those attending passed the full examination, being 25 per cent. higher than the result of last week's examination.

New Schools at Monton Green, near Manchester.—Building operations have just been commenced for the new schools adjoining the church erected here some years since. The schools are intended as a memorial to the late Mrs. Booth, and other members of a family who were large benefactors to the church and neighbourhood. The building will be faced with stone parpoints and Darley-dale ashlar, and will contain large school and class rooms on ground floor, with meeting room 64 by 32 ft. on first floor, and social rooms for the use of the congregation. The architects are Messrs. Thos. Worthington and F. G. Elgood, Manchester; and Messrs. Southern & Sons are the general contractors.

The London and County Banking Company (Limited).—The half-yearly report of the Directors of this Bank (which will be found *in extenso* in our advertising columns) states that, after paying interest to customers, and all charges, making provision for bad and doubtful debts, and allowing 21,837*l.* 13s. for rebate on bills not due, the net profits amount to 215,547*l.* 13s. 6d. This sum, added to 22,134*l.* 7s. 8d., the balance brought forward from last account, produces a total of 237,682*l.* 1s. 2d. The Directors have declared an interim dividend for the half-year of 10 per cent., which will absorb 200,000*l.*

"Short" Quantities.—Some letters on this head we are obliged to defer to next week, when we may also have some further comment to make on the questions suggested by the recent decision.

PRICES CURRENT OF MATERIALS.

TIMBER.	£.	s.	d.	£.	s.	d.
Greenheart, B.G. ....ton	6	10	0	7	10	0
Teak, E.I.....load	8	0	0	12	10	0
Sequoia, U.S.....foot cube	0	2	3	0	3	0
Birch, Canada .....load	2	15	0	4	15	0
Fir, Dantsic, &c.	2	0	0	4	0	0
Oak ,, ...	2	0	0	4	10	0
Canada	4	0	0	6	10	0
Pine, Canada red	2	10	0	3	10	0
,, yellow	2	10	0	4	0	0
Lath, Dantsic.....fathom	3	10	0	5	0	0
St. Petersburg.....	5	0	0	6	0	0
Wainscot, Odessa, crown.....	2	10	0	3	0	0
Deals, Finland, 2nd and 1st...std.100	8	0	0	9	10	0
,, 4th and 3rd.....	6	10	0	7	10	0
Riga	6	0	0	7	10	0
St. Petersburg, 1st yellow	9	10	0	14	10	0
,, 2nd ,, ...	8	0	0	9	0	0
,, white	7	0	0	10	0	0
Swedish.....	7	0	0	15	10	0
White Sea	8	0	0	17	0	0
Canada, Pine, 1st	14	0	0	23	0	0
,, ,, 2nd	9	0	0	15	0	0
,, ,, 3rd, &c.	7	0	0	9	10	0
,, Spruce, 1st	8	0	0	9	10	0
,, 3rd and 2nd	6	0	0	7	10	0
New Brunswick, &c.	6	0	0	7	5	0
Battens, all kinds	4	10	0	11	0	0
Flooring Boards, sq., 1 in., prepared, First	0	10	0	0	13	0
Second	0	7	0	0	9	6
Other qualities	0	4	6	0	6	6
Cedar, Cuba.....foot	0	0	3½	0	0	4
Honduras, &c.....	0	0	3½	0	0	3½
Australian	0	0	2½	0	0	3½
Mahogany, Cuba	0	0	4½	0	0	5½
St. Domingo, cargo average	0	0	4½	0	0	5½
Mexican ,, ...	0	0	4	0	0	4½
Tobasco ,, ...	0	0	4½	0	0	5½
Honduras ,, ...	0	0	4½	0	0	5½
Rose, Rio .....ton	8	0	0	11	0	0
Box, Turkey	5	0	0	12	0	0
Walnut, Italian .....foot	0	0	4½	0	0	6
METALS.						
Iron—Bar, Welsh, in London...ton	4	17	6	5	0	0
,, ,, at works in Wales ...	4	7	6	4	10	0
,, Staffordshire, in London ...	5	5	0	7	0	0
Copper—						
British, cake and ingot..... ton	74	0	0	75	0	0
Best selected	75	10	0	0	0	0
Sheets, strong	80	0	0	0	0	0
Chili, bars	81	10	0	0	0	0
Yellow Metal.....lb.	0	0	7½	0	0	7½
Lead—						
Pig, Spanish .....ton	13	0	0	13	2	6
English, common brands	13	5	0	13	7	6
Sheet, English.....	14	5	0	14	10	0
Spelter—						
Silesian, special .....ton	16	5	0	16	7	6
Ordinary brands.....	16	0	0	16	2	6
Tin—						
Straits .....ton	89	10	0	0	0	0
Australian	89	15	0	0	0	0
English Ingots.....	94	10	0	0	0	0
Zinc—						
English sheet.....ton	18	10	0	19	0	0
OILS.						
Linseed .....ton	18	2	6	18	5	0
Cocoanut, Cochin	24	10	0	27	0	0
Ceylon	22	0	0	0	0	0
Palm, Lagos	20	0	0	20	10	0
Rapeseed, English pale	25	10	0	0	0	0
,, brown	24	2	6	0	0	0
Cottonseed, refined	20	10	0	0	0	0
Tallow and Oleine	25	0	0	45	0	0
Lubricating, U.S.	4	0	0	6	0	0
,, refined	7	0	0	12	0	0
Turpentine—						
American, in casks.....cwt.	1	6	9	1	7	0
Tar—						
Stockholm .....barrel	0	15	9	0	0	0
Archangel	0	9	6	0	0	0

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *Noon on Thursdays.*]

ACTON.—For shops in High-street, Acton, W., for Mr. J. Beauchamp. Mr. Edward Monson, Junr., architect, Acton, W.:—

Edwards, J., Ealing	£4,050	0	0
Nye, T., Ealing.....	3,939	0	0
Penny & Co., Ealing	3,645	0	0
Hooper, G., Acton	3,553	0	0
Lyford, G., Shepherd's Bush*.....	3,450	0	0

* Accepted.

BEDFORD.—For works at The Bedford General Infirmary. Messrs. Usher & Anthony, Surveyors, Bedford:—

Internal Painting.

Judge & Ball.....	£130	0	0
Small & Co.	115	12	0
Key (accepted).....	108	0	0

[All of Bedford.]

Wrought Iron Fence.

Page & Co.....	£109	14	6
Kilpin & Billson	106	15	0
Bacchus & Ison.....	85	0	0
Baker (accepted)	83	15	0

[All of Bedford.]

BETHNAL GREEN.—For sundry sanitary works, fencing, &c., at the Workhouse, Bishop's-road, Bethnal-green, for the Guardians of Bethnal-green. Messrs. A. & C. Harston, architects, 15, Leadenhall-street, E.C. No quantities:—

R. Edwards.....	£800	0	0
Thomerson	780	0	0
Edmunds	634	0	0
P. H. Carder.....	623	0	0
J. Knight	597	17	0
Barrett & Power	575	0	0
T. Lye.....	490	0	0
Stidder, Davis, & Co., 50, Southwark Bridge-road (accepted)	470	0	0

CONTRACTS AND PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

CONTRACTS.

Nature of Work, or Materials.	By whom required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.	Page.
Slating	Leicester Cor. Gas Co.	A. Colson	August 11th	x.
New Ward, Sedgefield Asylum	Durham County Lunatic Asylum	*Official*	August 13th	ii.
Limestone or Asphaltic Tar-Paving	East Ham Local Board	W. H. Savage	August 14th	ii.
Firewood	Epsom Union	*Official*	do.	ii.
Repairs to Roads, Dartford	Met. Asylums Board	A. & C. Harston	August 18th	ix.
Painting and other Work, Dartford	do.	do.	do.	ix.
Additional Buildings, S.E. Ambulance Station	do.	T. W. Aldwinckle	August 20th	ix.
Erection of Wards at Workhouse	St. Marylebone Grdns.	H. Saxon Snell & Son	do.	ix.
Asphaltic Tar-Paving	Walthamstow Local Brd	*Official*	do.	x.
Making-up Roads	do.	do.	do.	x.
Broken Granite	Hanwell Local Board	do.	August 21st	ix.
Oak Fencing	Brentford Local Board	do.	do.	ix.
Church at Tredegar, Mon.	Rev. T. Theophilus	James & Morgan	do.	ix.
Iron Roof for Market Ground	St. Helen's Corporation	G. J. C. Broom	August 22nd	ii.
Foundations, General Post-Office North	Com. of H. M. Works	*Official*	August 28th	ii.
Three Houses for Coastguard, Cornwall	Admiralty	do.	do.	ii.
Construction of Aqueduct	Manchester Corporation Waterworks Com.	G. H. Hill	Sept. 4th	x.
Reservoir, Prestwich	do.	do.	do.	x.
Ironwork, Prestwich	do.	do.	do.	x.
Engineering Work, near Dartford	Met. Asylums Board	A. & C. Harston	Sept. 15th	ix.
Works, Repairs, and Supply of Building Materials	War Department	*Official*	Not stated	ii.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.	Page.
Junior Examiner, Office of Works	Civil Service Com.	Not stated	August 22nd	xiv.
Deputy-Assistant Overseer and Valuer	Brighton Guardians	150*l.*	August 28th	xiv.

BLACKHEATH.—For repairs and decorations to No. 17, Kidbrook Park-road. Mr. Leonard V. Hunt, architect, 35, Queen Victoria-street, E.C.:—

Couchman & Co., Blackheath	£284 0 0
Hodson Bros., Lewisham	254 0 0
S. J. Jerrard, Lewisham	192 0 0
Kennard, Bros., Lewisham (accepted)	158 0 0

BRADWELL-ON-SEA (Essex).—For alterations and additions to farm-house, Bradwell-on-Sea, Essex, for Mr. Jos. Willes. Mr. Harold O. Jackson, architect:—

H. Bishop, Southminster	£120 0 0

CHESHUNT (Herts).—For making alterations and additions to residence, Cheshunt, Herts, for Mr. John Crawter. Mr. Harold O. Jackson, architect:—

J. Bentley, Waltham Abbey	£1,740 0 0
W. Littlefield, Enfield	1,427 0 0
F. Sanders, Cheshunt	1,357 0 0

CHESHUNT (Herts).—For new conservatory, lavatory, and other works at residence, Cheshunt, Herts, for Mr. Wm. J. Galloway. Mr. Harold O. Jackson, architect:—

Crompton & Fawkes, Chelmsford	£330 0 0

CROYDON.—For alterations to No. 104, North-end. Mr. Alfred Broad, architect, Croydon. Quantities supplied by the architect:—

J. O. Richardson, Peckham (accepted)	£394 0 0

[No competition.]

DULWICH.—For alterations and repairs to Glenmore House, Underhill-road, Dulwich, for Dr. Rand. Mr. H. G. Brace, architect:—

Mitchell	£560 0 0
Whitehead	425 0 0
Waddington	362 0 0
T. Watson, Dulwich (accepted)	355 0 0

EGHAM.—For alterations and additions to "Englehurst," Englefield-green, Egham. Messrs. Elworthy & Son, architects, St. Leonards-on-Sea:—

G. Gray, Egham	£722 0 0
F. Harrison, Egham	617 5 0
A. Simpson & Co., Egham	581 15 0
Oades Bros., Egham	549 10 0
W. Watson, Ascot	496 0 0
Hutt & Satchwell, Richmond*	487 10 0

* Accepted.

FULHAM.—For the erection of new chapel. Mr. Charles Bell, architect:—

J. Allen & Sons, Kilburn (accepted)	£3,330 0 0

[No competition.]

HAMMERSMITH.—For fitting up stabling at Messrs. Carter, Paterson, & Co.'s depôt, Glenthorne-road, under the superintendence of Mr. W. Eve, F.S.I., 10, Union-court, Old Broad-street, E.C.:—

Godfrey & Son	£388 0 0
J. H. Johnson	382 0 0
Adamson & Sons	375 0 0
Harris & Wardrop	367 0 0
J. Holland	338 0 0
W. M. Dabbs	328 0 0
F. & H. F., Higgs, Station Works, Loughboro Junction (accepted)	313 0 0

HORNSEY.—For machinery for sewage treatment at the Board's Sewage Works, Irish-corner, for the Hornsey Local Board. Mr. T. de Courcy Meade, Engineer and Surveyor:—

H. W. Wilkinson & Co., Dockhead, S.E.	£894 0 0
S. H. Johnson & Co.,* Stratford, E.	467 0 0

* Accepted.

HORNSEY. — For disinfecting apparatus at New Cottage Hospital, Irish-corner, for the Hornsey Local Board. Mr. T. de Courcy Meade, engineer and surveyor:—

J. W. Lyon, size A, 178*l.*; size B, 232*l.* 10s.; size C	£373 0 0
Leete, Edwards, & Norman	268 0 0
Bradford	267 0 0
Goddard, Massey, & Warner, Nottingham (accepted)	200 0 0
Crane	131 0 0

HADLOW DOWN (Sussex). — For alterations and additions (allowing for old materials) at Hadlow Grange, Hadlow Down, Sussex. Mr. Geo. H. Fellowes Prynne, architect. Quantities supplied by Mr. R. Henry Hale, surveyor:—

Taylor Bros., Hastings	£5,680 0 0
A. H. White, St. Leonard's	5,365 0 0
J. Martin, Eastbourne	5,300 0 0
B. Cruttenden, St. Leonard's	5,042 0 0
A. Moon & Son, Rockerfield	4,835 0 0
J. & C. Bowyer, Norwood	4,590 0 0
G. Cheeseman, Uckfield	4,488 0 0
Charlwood Bros., East Grinstead	4,324 0 0
Mark Martin, Eastbourne (accepted)	4,200 0 0

HIGHGATE.—For alterations at The Cedars, Highgate-road, for Mr. D. P. Rodgers. Mr. Edward Power, architect, 16, King William-street, E.C.:—

Chas. E. Birch	£1,471 0 0
J. W. Dixon	900 0 0
F. J. Coxhead	834 0 0
S. Sabey & Son	792 0 0
J. Dover (revised and reduced tender accepted)	350 0 0

HIGH WYCOMBE.—For the erection of new residence, Amersham Hill, for Mr. John Parker, F.S.A. Mr. Arthur Vernon, High Wycombe, architect:—

Bywaters*	£3,900 0 0
Stanley G. Bird	3,109 0 0
Silver & Sons	3,081 0 0
Woodbridge	2,990 0 0
Grist	2,690 0 0
Claridge & Bloxham	2,582 0 0
Martin, Wells, & Co.	2,580 0 0
Snell & Co.	2,536 19 0
Flint & Maddeford	2,449 0 0
Loosley	2,344 11 0
Webster & Cannon	2,323 18 9
Hunt	2,293 0 0
Gibson (accepted)	2,240 15 0
Martin	2,164 7 10

* Including Stabling and Walling.

Stabling.

Webster & Cannon	£241 0 0
Stanley G. Bird	239 0 0
Silver & Sons	234 0 0
Claridge & Bloxham	231 0 0
Woodbridge	215 0 0
Grist	208 0 0
Gibson (accepted)	206 0 0
Snell & Co.	194 0 0
Martin, Wells, & Co.	193 14 0
Hunt	189 0 0
Martin	180 16 6
Flint & Maddeford	179 0 0
Loosley	174 18 0

Walling.

Stanley G. Bird	£383 0 0
Silver & Sons	380 0 0
Grist	350 0 0
Woodbridge	345 0 0
Martin, Wells, & Co.	327 6 0
Snell & Co.	326 1 0
Claridge & Bloxham	307 0 0
Hunt	295 0 0
Loosley	286 19 0
Webster & Cannon	286 10 4
Flint & Maddeford	279 0 0
Martin	275 19 8
Gibson (accepted)	247 13 0

KENSINGTON.—For sanitary and decorative repairs at 53, Earl's Court-square, S.W., for Mr. Richard Chamberlain, M.P. Messrs. Morley & Letts, surveyors, 185, Earls' Court-road, S.W.

E. K. Wilson	£249 1 6
H. Smith & Sons	244 0 0
F. W. Heath	240 0 0
Toten & Sons, Gloucester-road*	225 0 0
Lavender & Sons	208 0 0

* Accepted.

KENSINGTON.—For sanitary alterations and repairs at 6, Warwick-road, for the Hon. A. M. Forbes. Messrs. Morley & Letts. surveyors, 185, Earls' Court-road, S.W.

Toten & Sons, Gloucester-road*	£125 0 0

* Accepted.

KILBURN.—For fitting up stabling at Messrs. Carter, Paterson, & Co.'s depôt, Dyne-road, under the superintendence of Mr. W. Eve, F.S.I., 10, Union-court, E.C.:—

Godfrey & Son	£230 0 0
Adamson & Sons	225 0 0
Harris & Wardrop	220 0 0
J. H. Johnson	215 0 0
J. Holland	200 0 0
W. M. Dabbs	193 0 0
F. & H. F. Higgs, (accepted)	184 0 0

KILBURN.—For completing three houses in Brondesbury-villas, under the superintendence of Mr. William Eve, F.S.I., 10, Union-court, Old Broad-street, E.C.:—

Avis & Son, 169, Holydale-road, Peckham (accepted)	£991 0 0

LINCOLN.—For the erection of a pair of cottages, fruit and potato stores, and foundations of weighbridge, at the Canwick Irrigation Farm, for the Corporation of Lincoln, from plans, specifications, and quantities supplied by Mr. R. A. MacBrair, City Surveyor:—

W. Stothard, Billinghay	£806 0 0
J. Greenham, Branston	588 18 0
Horton, Holmes, & Horton, Lincoln	583 0 0
J. W. Harrison, Lincoln	559 0 0
H. S. & W. Close, Lincoln	550 0 0
J. Crosby & Sons, Lincoln	535 0 0
J. Brooks, Lincoln	523 0 0
G. Cowen, Lincoln	519 0 0
J. & H. Woolhouse, Lincoln	515 0 0
W. Reynolds, Lincoln	489 0 0
J. B. Harrison, Lincoln (accepted)	488 0 0

LONDON.—For new baths and washhouses in Buckingham Palace-road, S.W., for the Commissioners of Public Baths and Washhouses for the Parish of St. George, Hanover-square. Mr. F. J. Smith, architect:—

Gaisford	£34,041 0 0
Ramsey	31,340 0 0
Kirk, Knight, & Co.	30,575 0 0
Shillitoe	30,467 0 0
Boyce	29,728 0 0
Chappell	29,720 0 0
Nightingale	29,381 0 0
H. Young & Co.	29,357 10 0
Krauss	29,026 11 0
Holloway Bros.	28,858 0 0
Gentry	28,590 0 0
Kirk & Randall	28,424 0 0
Kynoch	28,385 0 0
J. Holloway*	28,367 0 0
Brass & Sons	28,313 0 0
Mowlem & Co.†	28,209 0 0

* Rejected as informal. † Accepted.

LONDON.—For painting and other works at the Workhouse, Bromley-by-Bow, and to the Union Premises, Stepney, &c., for the Guardians of the Stepney Union. Messrs. A. & C. Harston, architects, 15, Leadenhall-street, E.C. No quantities:—

Collyer	£548 0 0
Hadlow	433 0 0
Wythe	409 0 0
Barker	395 0 0
Stevenson	295 0 0
A. W. Derby, 21, Devon's-road, Bow*	279 0 0

* Accepted.

LONDON.—For gas-fittings for Mr. Parish, at "The Wellington," Strand. Mr. W. West, architect:—

Steadman	£173 14 6
Winn	169 19 6
Buckley & Beach	166 10 0
Heavens & Co.	160 10 0
J. Biggs, Boro'-road (accepted)	151 10 0

LONDON.—For additions to hat manufactory, Bennett-street, Blackfriars-road, for Mr. Samuel Cooksey:—

G. Phillips	£312 10 0
G. Newton	306 0 0
W. & H. Castle	285 7 7
T. Simpson,* 105, Borough, S.E.	275 0 0

* Accepted.

LONDON.—For laying down new carriageways and York stone footways, and executing other works in connexion therewith, for the purpose of widening Elm-street and a part of Gray's Inn-road, for the Metropolitan Board of Works. Sir J. W. Bazalgette, engineer:—

	Total.	Deduction for tramway.
Rutty	£4,800	£800
Nowell & Robson	4,091	805
Biggs	3,700	600
Mowlem & Co.	3,490	710
Griffiths (accepted)	2,800	760

LONDON.—For proposed new factory, Pomeroy-street, Old Kent-road. Mr. Edward Power, architect, 16, King William-street, E.C.:—

F. J. Coxhead	£3,950 0 0

LONDON.—For alterations and repairs to The Nag's Head public-house, 324, Hackney-road, N.E., for Mr. Charles Deakin. Mr. Arthur W. Saville, architect, 99, Strand, W.C. Quantities supplied:—

G. Colls	£1,200 0 0
S. Goodall	1,170 0 0
Drew & Cadman	1,146 0 0
Gould & Brand	1,143 0 0
Ward & Lamble	1,125 0 0
S. Yardley & Sons	1,115 0 0
W. Oldrey & Co.	1,114 0 0
Spencer & Co.	1,075 0 0
John Walker	930 0 0

Pewterer's Work.

T. Heath	171 0 0
W. Rogers	170 0 0
Watts & Co.	148 0 0
W. Helling	145 0 0
F. J. Ruse	131 0 0

Gasfitter's Work.

Vaughan & Brown	63 2 6
W. Winn	56 0 0
E. Pragnell	52 10 0

LONDON.—For decorative and sanitary work at 8, Brondesbury-road, Kilburn, N.W. Mr. Delissa Joseph, architect, 17, Basinghall-street, E.C.:—

G. Cox	£289	10	0
A. W. Hammond	237	0	0
J. Allen & Sons	220	0	0
W. M. Dabbs	189	0	0

LONDON.—For repairs at premises, 211, Hampstead-road, N.W., for The West St. Pancras Liberal and Radical Club Company. Mr. Arthur W. Saville, architect, 99, Strand, W.C.:—

H. Hendy	£188	0	0
C. Cole	129	12	0
J. Vears & Co.	128	0	0
J. Styles & Son	120	0	0
T. W. Morris	85	0	0
F. P. Treweeke	70	10	0

LUDLOW.—For new Town-hall, Public Market, and Corn Exchange, Ludlow. Mr. Henry A. Cheers, architect, Twickenham:—

Ed. Gabbutt, Liverpool	£7,157	0	0
Wede, Ludlow	6,989	0	0
Wood & Sons, Worcester	6,943	0	0
Jno. Groves, Shrewsbury	6,600	0	0
D. C. Jones & Co., Gloucester	6,582	0	0
H. Milward, Leominster	6,574	0	0
Jno. Inwood, Malvern	6,558	0	0
Jno. Williams, Knighton	6,500	0	0
Jno. Gethin, Shrewsbury	6,389	0	0
Thos. Foster, Abergavenny	6,337	0	0
Treasure & Son, Shrewsbury	6,288	0	0
Shillitoe & Son, Bury St. Edmunds	6,229	0	0
T. Grosvenor, Ludlow	6,200	0	0
Edwards, Leominster	6,180	0	0
Jno. Everal, Malvern	6,112	0	0
Horsman & Co., Wolverhampton	6,100	0	0
Samuel Warburton, Manchester	6,000	3	0
F. Davies, Shrewsbury	5,987	0	0
J. Jones & Son, Wolverhampton	5,750	0	0
W. Bowers & Co., Hereford	5,637	0	0
R. Price, Shrewsbury (accepted	5,500	0	0

LUTON.—For new business premises, Wellington-street, Luton, for Mr. E. Deacon. Mr. W. J. Pearson, architect:—

Wright	£1,176	0	0
Dunham	1,643	0	0
Parkins	1,630	0	0
Ford	1,625	0	0
Neville Bros.	1,560	0	0
Smart	1,543	0	0
Pryor (accepted)	1,460	0	0

ORPINGTON (Kent).—For additions and repairs to private residences. Mr. St. Pierre Harris, architect, 1, Basinghall-street, E.C.:—

C. Hudson	£386	0	0
Somerford & Son	342	0	0
W. Owen	337	0	0
Lowe	320	0	0
Johnson	269	0	0

RUSHDEN.—For the erection of new bakery at Rushden, Northamptonshire, for Mr. W. Hipwell. Messrs. Usher & Anthony, architects, Bedford:—

Harrison, Bedford	£960	0	0
White, Bedford	930	0	0
Knight, Rushden	910	0	0
Henson, Wellingborough	890	0	0
Bays, Rushden	890	0	0
Brown, Rushden	888	0	0
Adnett & Everard, Rushden	840	0	0
Sparrow, Rushden	819	0	0
Slinn, Rushden	800	0	0
Foskett, Rushden (accepted)	795	0	0

STAINES.—For alterations and repairs, &c., to house, Gresham-road, Staines, for Major Lane. Mr. Fitt, architect, Staines:—

Reavell, Staines	£199	0	0
Henley, Penge	180	0	0
Baker, Staines	146	0	0
Oades Bros., Egham	122	10	0
Powell, Staines (accepted)	120	0	0

STRATFORD.—For fitting up stabling at Messrs. Carter, Paterson, & Co.'s depôt, Angel-lane, under the superintendence of Mr. Wm. Eve, F.S.I., 10, Union-court, Old Broad-street, E.C.:—

Godfrey & Son	£350	0	0
Adamson & Sons	327	0	0
Harris & Wardrop	320	0	0
J. H. Johnson	319	0	0
J. Holland	297	0	0
W. M. Dabbs	294	0	0
F. & H. F. Higgs (accepted)	278	0	0

WATFORD (Herts).—For new stabling at the Rose and Crown Hotel, for Mr. F. Fisher. Mr. C. P. Ayres, Watford, arthitect:—

Andrews & Sons	£968	0	0
G. & J. Waterman	946	0	0
H. M. Dove	898	0	0
W. B. Neal	894	0	0
C. Brightman	886	0	0
T. Turner (Limited)	884	0	0
Clifford & Gough	875	0	0
Judge & Eames (accepted)	863	17	0

[All of Watford.]

Offices, Cloak-lane—In reference to the announcement on p. 94 of the last number of the *Builder*, that Mr. T. Tayler Smith is the architect of the new block of offices in Cloak-lane, we are asked to state that Mr. Edward Power is joint architect with Mr. Smith for the new building.

Warming, Amies-street Board Schools.—Messrs. William Jenkins & Son, of Leamington, write to say that their name should have appeared in the list of tenders for this work which appeared on p. 53 of the *Builder* for July 21. The amount of their tender was 500*l*.

SUBSCRIBERS in LONDON and the SUBURBS, by prepaying at the Publishing Office, 19s. per annum (or 4s. 9d. per quarter), can ensure receiving "The Builder" by *Friday Morning's post*.

TO CORRESPONDENTS.

C. B. (thanks).—G. A. (we may have more to say on the subject, and will keep your letter in view; but we cannot regard the joint as any improvement on that already illustrated).—F. W.—W. B. D. (thanks; we have forwarded your letter to "Boreas").—"Engineer" (too late for this week).—"In a Fix" (should have enclosed name and address. We cannot recommend anything for colouring the stone, which is a very barbarous practice; and we should strongly recommend your client to let it alone, and leave it to time, which will operate much quicker than he expects).

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication

We are compelled to decline pointing out books and giving addresses.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

PUBLISHER'S NOTICES.

Registered Telegraphic Address, "The Builder, London."

THE INDEX and TITLE-PAGE for Volume LIV. (Jan. to June, 1888) was given as a Supplement with July 14.

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Addressed to No. 46, Catherine-street, W.C.

Advertisements for the current week's issue must reach the Office before THREE o'clock p.m. on THURSDAY, and for the Front Page by the same Hour on WEDNESDAY.

SPECIAL.—ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same, must reach the Office before TEN o'clock on WEDNESDAY mornings:

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS Advertising in "The Builder," may have *Replies addressed to the Office*, 46, Catherine-street, Covent Garden, W.C. *free of charge*. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage

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THE BRAMBLEDITCH STONE. Is of the same crystalline nature as the Chelynch Stone, but finer in texture, and more suitable for fine moulded work.
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London Agent—Mr. E. A. WILLIAMS, 16, Craven-street, Strand, W.C. [Advt.

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds, and milk-rooms, graneries, tun-rooms, and terraces. [Advt.

Asphalte.
Seyssel, Patent Metallic Lava, and White Asphaltes.
M. STODART & CO., Office:
No. 90, Cannon-street, E.C. [Advt.

SPRAGUE & CO.,
PHOTOLITHOGRAPHERS,
22, Martin's-lane,
Cannon-street, E.C. [Advt.

Garside's Noted Bedfordshire Coarse and Fine Silver Sand.—Is perfectly free from impurity, and the best and cheapest in the market. All qualities in stock, for every purpose required in the building trade, for filtration, or for nursery purposes. All pure grit!
Apply to
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121, Bunhill-row, London, E.C.
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LASCELLES' CONCRETE,
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The Bank of England and its Branches, including New Law Courts Branch, now building.
PATENT PROTECTOR AND LEVER LOCKS, for all Purposes.
STEEL SAFES, STRONG-ROOM & PARTY-WALL DOORS.
SELF-CLOSING DOORS, FOR THEATRES AND PUBLIC BUILDINGS,
As approved by the Metropolitan Board of Works (used in large numbers at Covent Garden Theatre).
IMPORTANT COMMUNICATION.—FIRE AT WHITELEY'S.
William Whiteley, Westbourne Grove,
London, Oct. 12th, 1887.
HOBBS, HART, & CO., Limited.
Gentlemen.—It affords me very much pleasure to express to you my satisfaction and admiration at the splendid fire-resisting powers of your Strong-room doors and the Safes.
The recent fire at my establishment in my opinion subjected them to the greatest possible test, and through all, they proved invulnerable.
The contents of both Strong Rooms and Safes were entirely preserved, although the fire was of such intense destructive force.
You will be pleased to hear that it has been decided to adopt your Patent Clutch-rebated Doors for all the party-walls in the new buildings now in course of erection.—I am, Gentlemen, faithfully yours,
(*Signed*) William Whiteley.
Offices and Warehouse: 76, CHEAPSIDE, London; Manufactories, Wharncliffe Works, Arlington-street, London, N.

The Phototype Co., 303, Strand, London.

MEMORIAL STATUE OF THE LATE CARDINAL GIRAUD, FOR THE CATHEDRAL OF CAMBRAI. M. CRANK, SCULPTOR.

The Phototype Co., 303, Strand, London.

THE WALLACE STATUE, ABERDEEN.

MR. W. GRANT STEVENSON, SCULPTOR.

COMPETITION DESIGN FOR BLACKBURN TECHNICAL SCHOOL

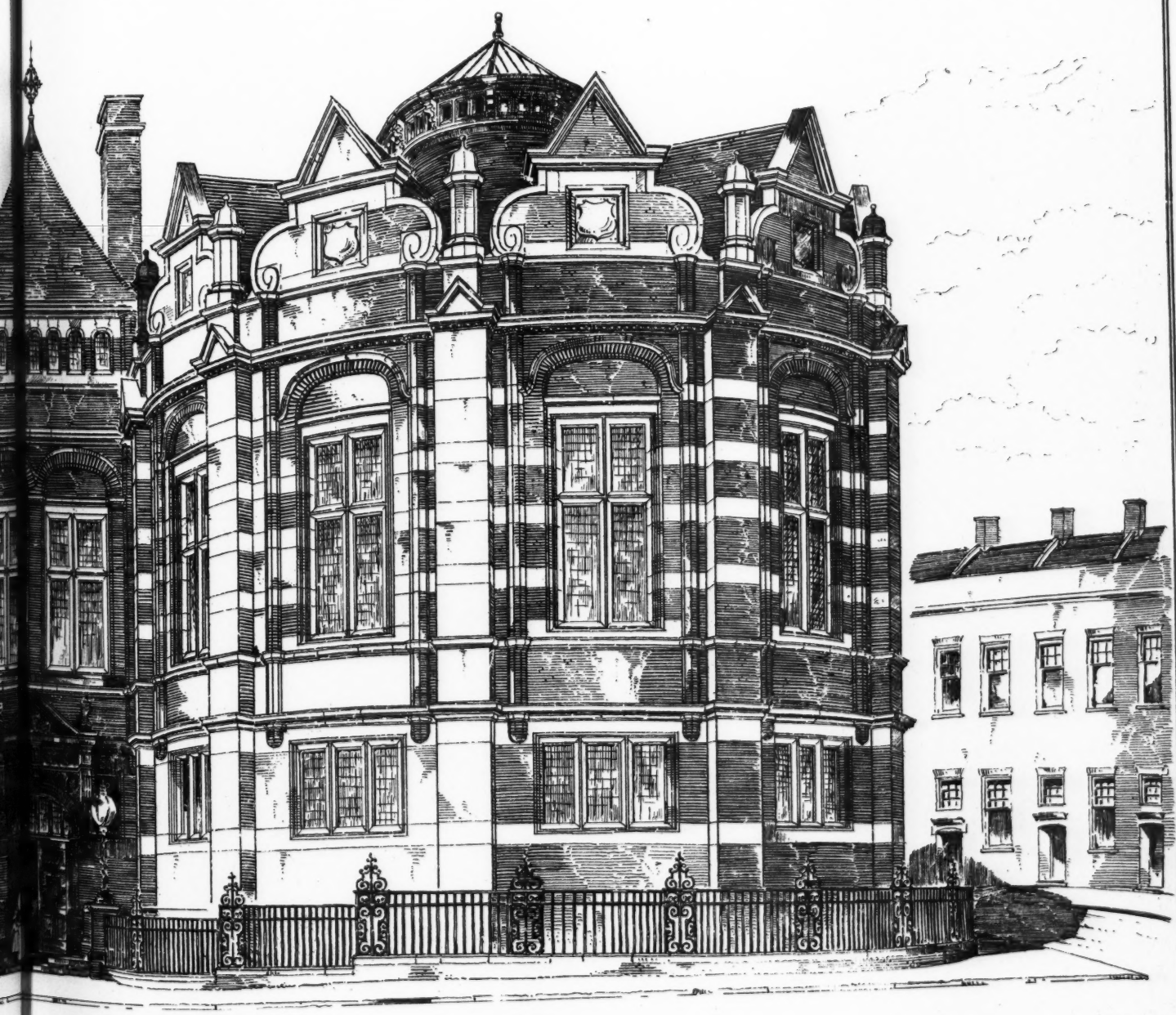
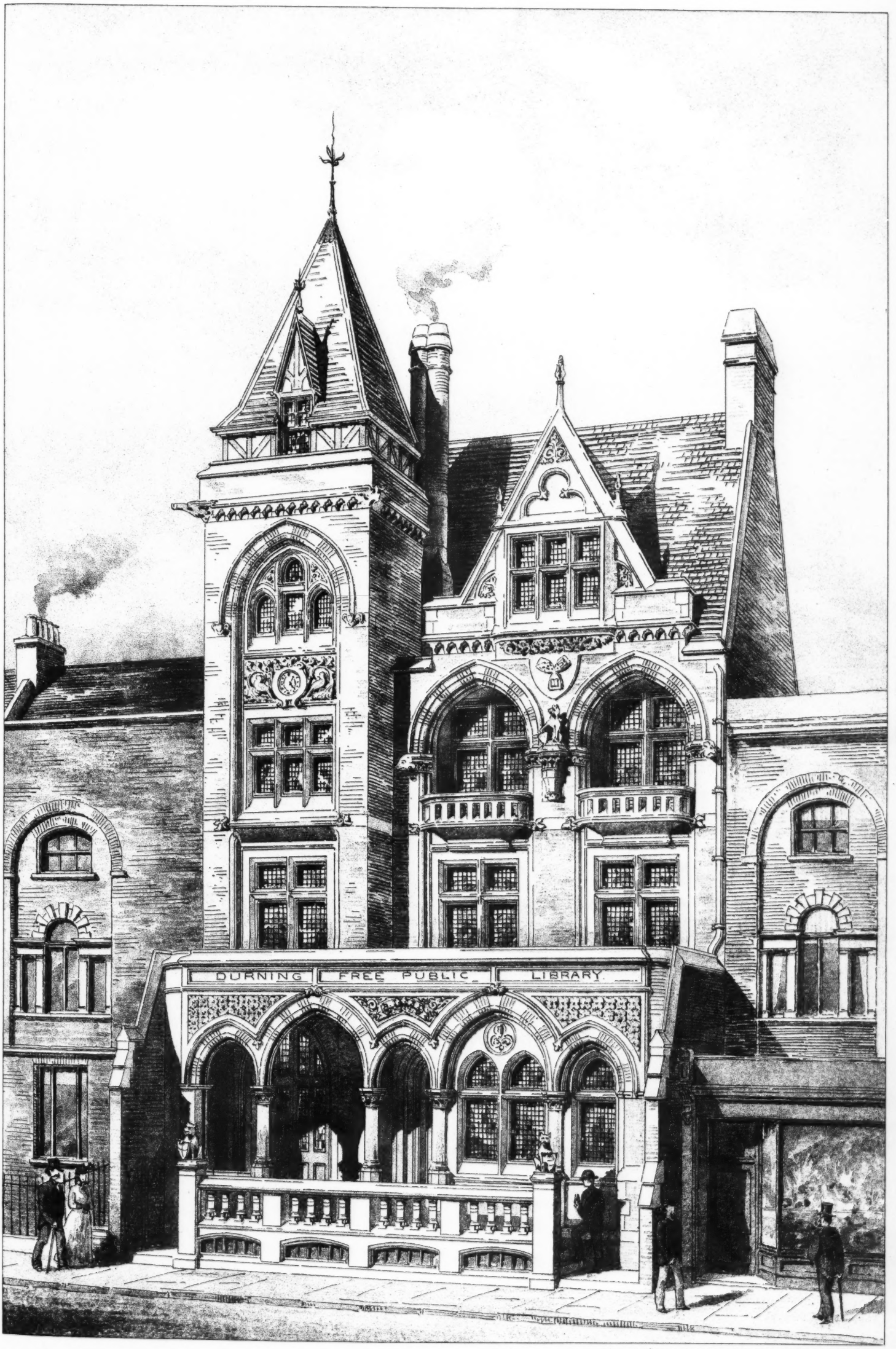


PHOTO-LITHO, SPRAGUE & Co 22, MARTINS LANE, CANNON ST, LONDON, E.C.

NIC SCHOOL.—Messrs. Spalding and Auld, Architects.

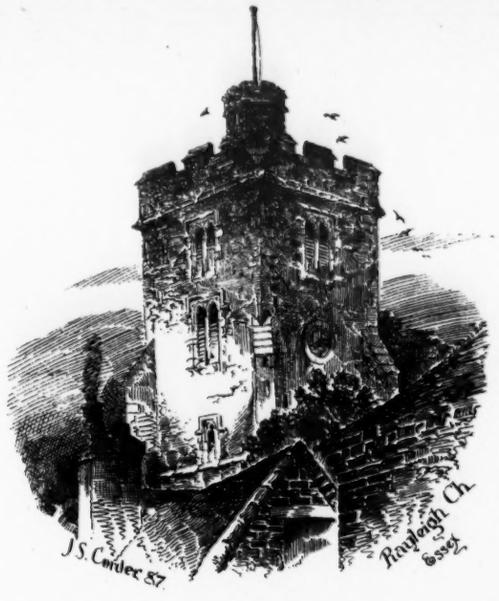
"INK PHOTO" SPRAGUE & Co. 22, MARTINS LANE, CANNON ST, LONDON, E.C.

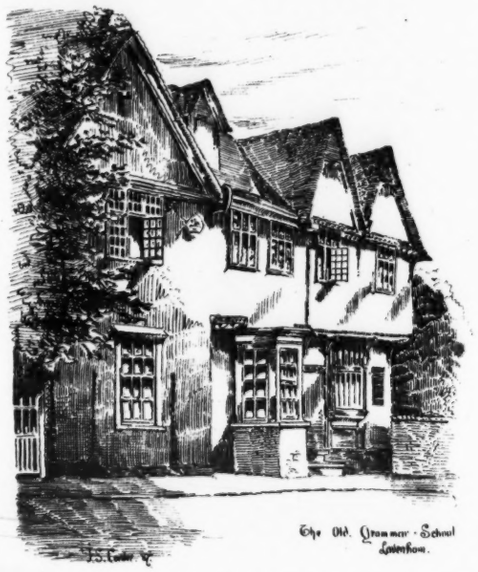
HOUSES, CHEYNE WALK, CHELSEA.—Mr. F. Hemings, Architect.



"INK-PHOTO," SPRAGUE & Co, 22, MARTINS LANE, CANNON ST, LONDON, E.C.

NEW DURNING LIBRARY, LOWER KENNINGTON LANE.—Mr. Sidney R. J. Smith, A.R.I.B.A., Architect.





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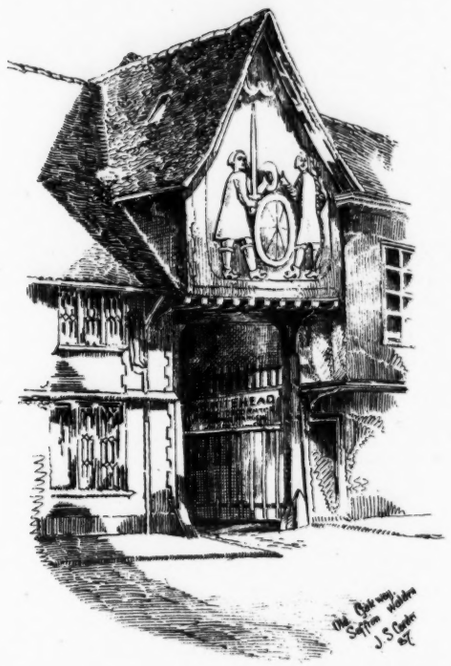
From

An Architect's Sketch Book



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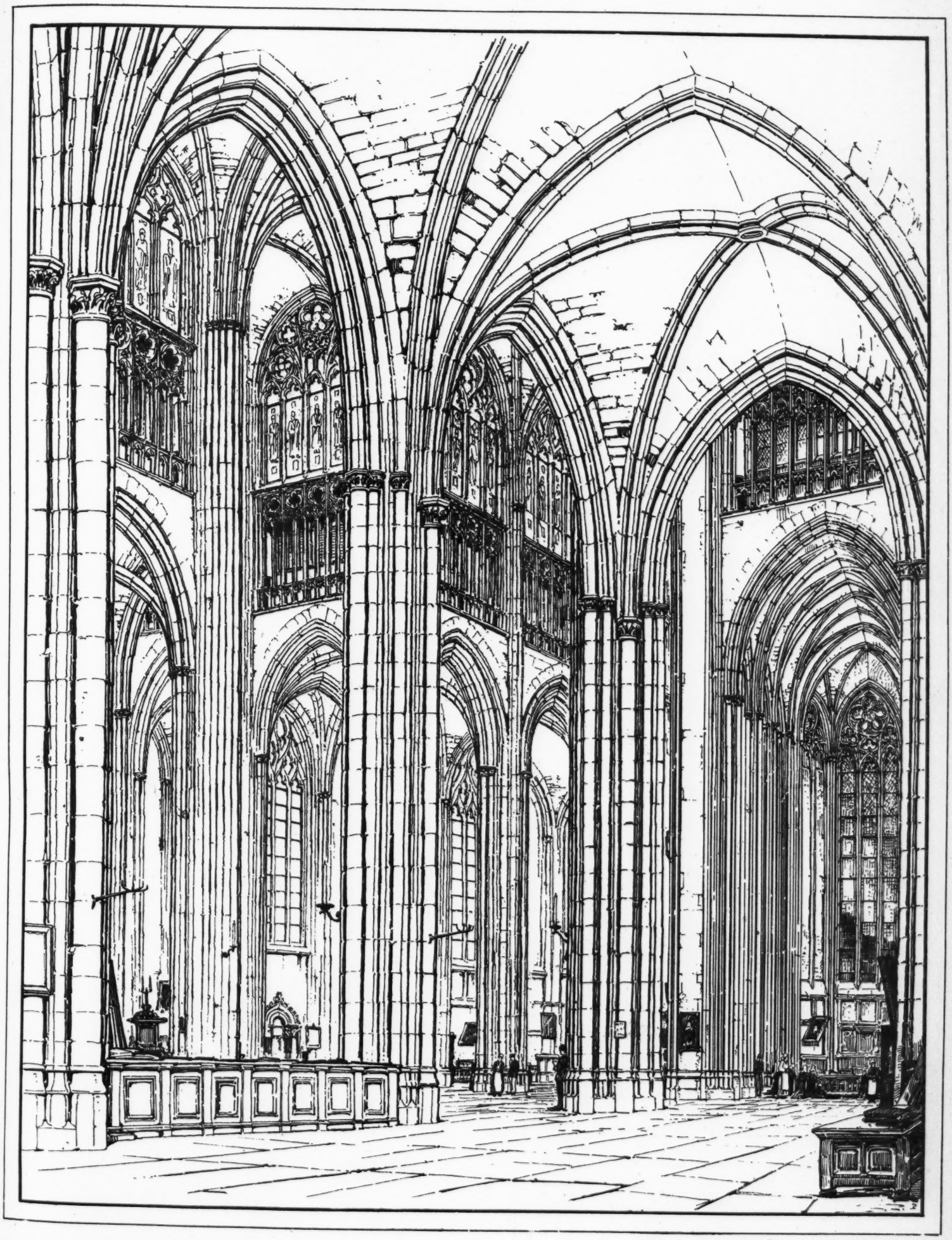

PHOTO-LITHO. SPRAGUE & Co 22, MARTINS LANE, CANNON ST, LONDON, E.C.

VIEW IN ST. OUEN, ROUEN.—From a Drawing by Mr. F. Williamson.